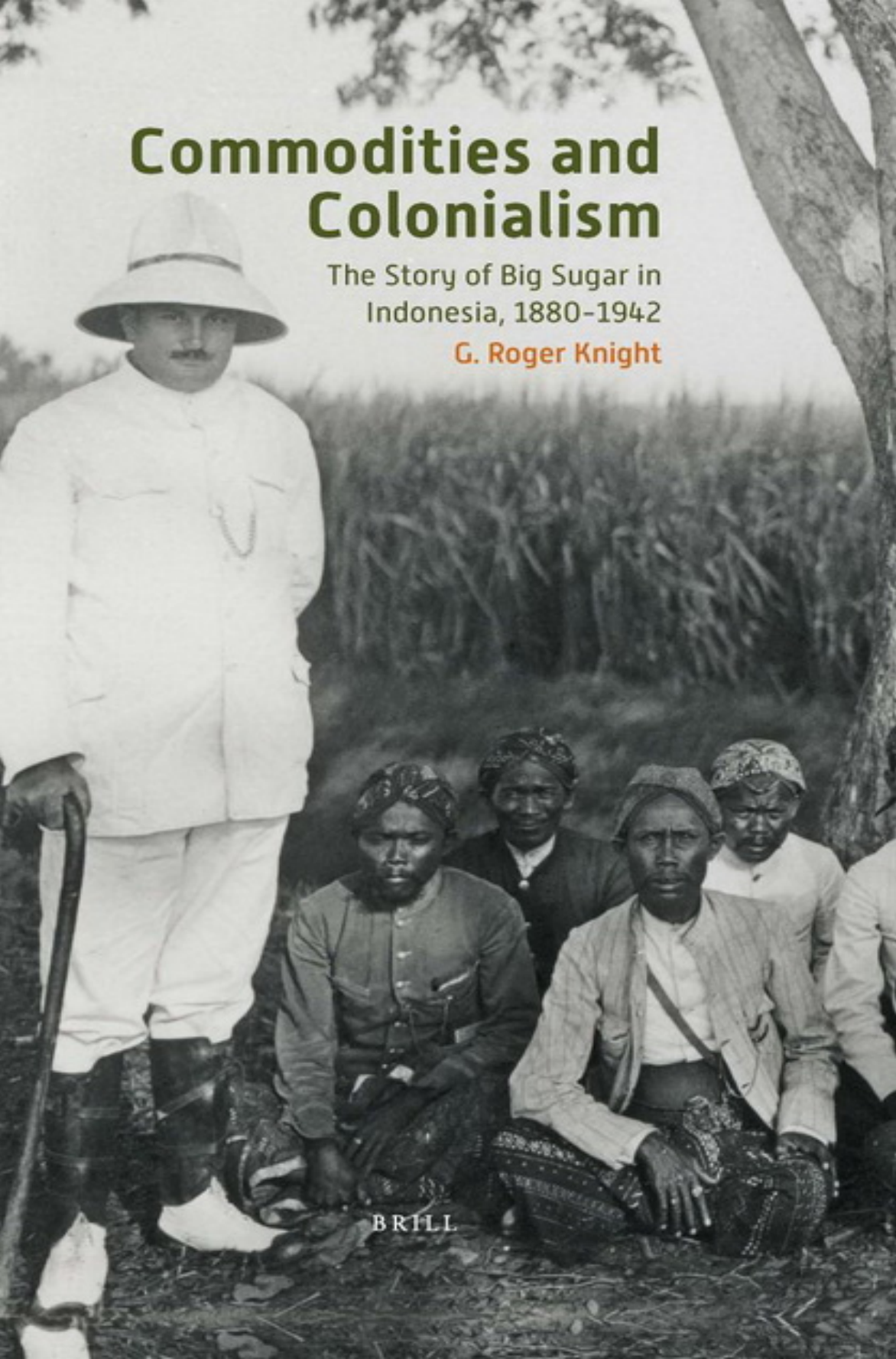
Commodities and Colonialism

The Story of Big Sugar in Indonesia, 1880–1942

G. Roger Knight



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The Story of Big Sugar in Indonesia, 1880-1942

By
G. Roger Knight

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Abbreviations

BB	Binnenlands Bestuur
BENISO	Bond van Eigenaren van Nederlandsch-Indische Suikerondernemingen
BOT	Bank of Taiwan (Taiwan Ginko)
BPM	Bataafsche Petroleum Maatschappij
CSR	China Sugar Refinery
DJB	De Javasche Bank
HVA	Handelsvereeniging Amsterdam
IISG	Internationaal Instituut voor Sociale Geschiedenis
JSS	Papers of John Swire and Sons
KB	Koloniale Bank
KHT	Kwik Hoo Tong Trading Society
KIT	Koninklijk Instituut voor de Tropen
KITLV	Koninklijk Instituut voor de Taal-, Land- en Volkenkunde
KNIL	Koninklijk Nederlands-Indisch Leger
KNSM	Koninklijke Nederlandsche Stoomboot Maatschappij
KPM	Koninklijke Paketvaartmaatschappij
MT	metric ton
NA	Nationaal Archief
NEHA	Nederlandsch Economisch-Historisch Archief
NHM	Nederlandsche Handel-Maatschappij
NILM	Nederlandsch-Indische Landbouw-Maatschappij
NIVAS	Nederlandsch-Indische Vereeniging voor de Afzet van Suiker
OTHC	Oei Tiong Ham Concern
PFB	Personeel Fabriek Bond
POJ	Proefstation Oost-Java
VJSP	Vereniging Verenigde Java-Suiker
ZA	zwavelzure ammoniak

Preface

Sugar yesterday was what oil is today: a commodity of immense global importance whose tentacles reached deep into politics, society and economy. Indonesia's colonial-era sugar industry – operating almost exclusively on the island of Java – is largely forgotten, except by a small number of regional specialists writing for a specialist audience. During the period 1880-1940 covered by this book, however, the island was one of the world's very greatest producer-exporters of the commodity. How it contrived to do so is the story of this book.

There are quite a number of histories of the industry, though most of them deal with it in a fragmented and somewhat insular fashion. Most recent studies (including the author's own) have been regional ones, and have largely ignored how the industry's developments were shaped by the 'big picture' of sugar as a major world commodity. Indeed, their focus has been less on the industry per se than on its impact on the social and economic evolution of rural Java. Essentially, they belong to the field of 'peasant studies' rather than to the history of commodities. It is precisely this latter perspective, however, which is espoused by the present volume.

Some parts of the title of a book called *Commodities and colonialism: The story of Big Sugar in Indonesia, 1880-1942* need more explanation than others. 'Commodities' is hardly problematic. The large-scale commodity production of agricultural goods for international markets was inseparable from the economic history of much of Southeast Asia from early in the nineteenth century up to the Second World War. In the case of colonial Indonesia, from around 1880 until the 1920s, sugar was the foremost of these in terms of value, and constituted a key node along a global commodity chain that linked Indonesian producers to (primarily, from circa 1905 onward) consumers elsewhere in Asia. Consumers as well as producers play an important role in this book.

'Colonialism' is likewise hardly exceptionable, though it might perhaps have been so a few decades ago, among those who still conceived of it as a monolithic enterprise. The vacuity of that view, and of the simple

binaries to which it gave rise, is hardly a matter for elaboration today. Colonialism is clearly central to the story; but then, as Fred Cooper has famously remarked in a euphoniously entitled book, 'Colonialism' is itself 'in question'. If colonialism helps 'explain' sugar, then sugar in turn serves to highlight the varieties of colonialism itself. Quite deliberately, while focusing on the big picture of the industry's development, the book also draws attention to things that help give colonialism its texture and complexity. One result of this is that there are a lot of people – 'colonial' people – in the following pages (while much of the statistical 'apparatus' will be found only in the appendices).

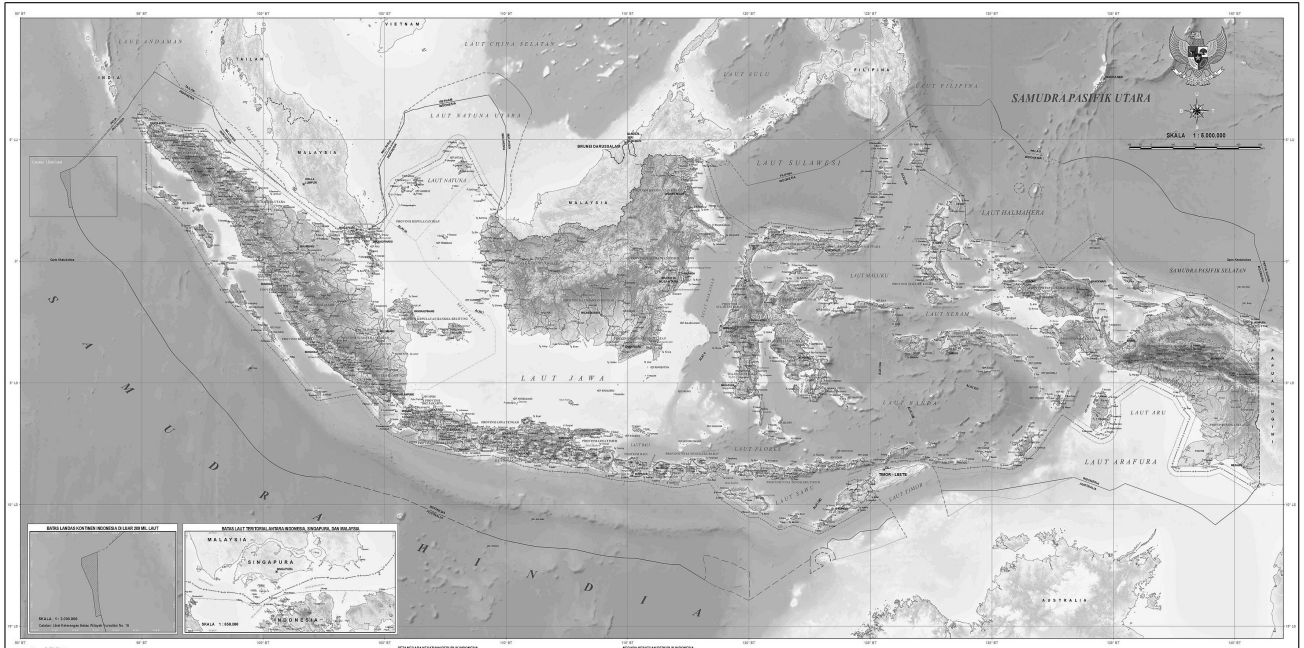
The phrase 'Big Sugar' may cause more difficulty for the reader. It is, of course, an anachronistic usage when talking about the industry late in the nineteenth and early in the twentieth century. Yet, it conveys something of the sheer heft – the weight and the influence – of sugar capital's positioning in this particular colonial enterprise. At the same time, it also makes possible an important distinction about the commodity's production in late colonial Java. Juxtaposed with Big Sugar, in the sense of the heavily capitalized, industrial-style manufacture of the commodity for export, was a local, small-scale artisan 'industry' of considerable antiquity that provided the people of Java (and elsewhere in Indonesia) with a totally different form of the product. Since the focus of the present volume is firmly on the story of an industry controlled almost exclusively by Dutch and Indies-Chinese interests, the use of the term 'Big Sugar' to delineate its operations avoids a conflation that is potentially damaging to an altogether broader understanding of the commodity's history in this part of Southeast Asia.

That Southeast Asian context is underscored by the use of the term 'Indonesia', rather than 'Java' or 'the Netherlands Indies'. To be sure, the present-day Indonesian state only emerged from the Netherlands Indies during the second half of the 1940s, and (as is emphatically not the case today) sugar production was confined historically to the island of Java, with its famously fertile soils and densely settled population. Nonetheless, 'Indonesia' conveys a level of meaning to twenty-first-century readers that is otherwise in danger of being lost. The point is hardly controversial, any more than that of the time frame of '1880-1942' chosen for the present study. Chronologically, it begins, approximately and appropriately, with the opening of new markets for new types of sugar – white, 'pure' and factory-made – in Asia itself (something of which Big Sugar

in Indonesia took massive advantage), and ends some fifty or more years later with the sudden collapse of the hegemony that the Indonesian sugar industry had established in those markets over the intervening decades.

This book is one of the many outcomes over the years of my research on this particular commodity and its place in the history of colonialism in Asia and in the international sugar economy. Correspondingly, it draws hugely on the work, assistance, advice and support of others. Not being an American academic, I will not spend the next five pages identifying them. They know who they are and they know my profound gratitude. One person I will name, however, because he did not live to see the completion of a work whose genesis he did so much to encourage. This is Professor Frans Hüsken, late of the Universities of Amsterdam and Nijmegen. Like all those scholars who had the extreme good fortune to know Frans, I am for ever in his debt.

PETA NEGARA KESATUAN REPUBLIK INDONESIA



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H. Kerajaan

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26 - 50 m
51 - 100 m
101 - 200 m
201 - 500 m
501 - 1000 m
1001 - 2000 m
2001 - 3000 m
3001 - 4000 m
> 4000 m

Warna Ketinggian :
> 1500 m
1001 - 1500 m
501 - 1000 m
301 - 500 m
201 - 300 m
101 - 200 m
51 - 100 m
26 - 50 m
11 - 25 m
0 - 10 m

PETA NEGARA KESATUAN REPUBLIK INDONESIA

Peta ini menggambarkan wilayah kedaulatan Negara Kesatuan Republik Indonesia di darat dan laut, luch tempat laut terletak (laut wilayah), dan ruang udara di atasnya, dengan batas-batas yang ditetapkan berdasarkan Undang-Undang Dasar Negara Republik Indonesia Tahun 1945, yang penetapannya dilakukan atau akan ditentukan Pemerintah Indonesia dan tetangganya, dan berdasarkan hukum internasional. Peta NKRI skala 1:6.000.000 ini menggunakan batas Negara yang telah disepakati oleh Pemerintah Indonesia dan tetangga-tetangganya yang berbatasan dan di dalam wilayah NKRI.

KONTRIBUTOR

Kementerian Koordinator Bidang Politik, dan Keamanan; Kementerian Koordinator Bidang Perekonomian; Kementerian Dalam Negeri; Kementerian Luar Negeri; Kementerian Pertahanan; Kementerian Hukum dan Hak Asasi Manusia; Kementerian Keuangan; Kementerian Energi dan Sumber Daya Mineral; Kementerian Perhubungan; Kementerian Kelautan dan Perikanan; Markas Besar Tentara Nasional Indonesia; Markas Besar Kepolisian Negara Republik Indonesia; Badan Informasi Geospasial; Badan Nasional Pengelola Perbatasan; Badan Pusat Statistik; Kementerian Pekerjaan Umum dan Perumahan Rakyat

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7. Peta Dasar Daerah Batas Wilayah Negara Indonesia skala 1:50.000, DSPACROS TA 43, 2012
8. Peta Dasar Batas Wilayah Negara Indonesia skala 1:10.000, DSPACROS TA 44, 2012
9. Citra Satelit Resolusi Tinggi (CSRT) Tahun 2015 dan 2020

PENGESAHAN

Peta ini telah disahkan oleh Pemerintah Republik Indonesia dan Pemerintah Malaysia berdasarkan :
1. Undang-Undang Nomor 4 Tahun 1960 tentang Perairan Indonesia
2. Undang-Undang Nomor 6 Tahun 1996 tentang Perairan Indonesia
3. Undang-Undang Nomor 17 Tahun 1985 tentang Pengesahan United Nations Convention on the Law of the Sea (Konvensi Perserikatan Bangsa-Bangsa tentang Hukum Laut)
4. Undang-Undang Nomor 4 Tahun 1960 tentang Perairan Indonesia
5. Undang-Undang Nomor 43 Tahun 2008 tentang Wilayah Negara

NEGARA KESATUAN REPUBLIK INDONESIA

Negara Kesatuan Republik Indonesia (NKRI) merupakan Negara Kepulauan (Archipelago State) yang berbatasan dengan 10 (sepuluh) negara, yaitu India, Thailand, Malaysia, Singapura, Vietnam, Filipina, Palau, Papua Nugini, Australia, dan Timor Leste.

LINGKUNGAN CAKUP WAKTU

Effective date : WGS84 world wide, disesikan pada semua pulau yang berada di wilayah dalam garis pangkal Kepulauan Indonesia. Khusus di P. Kalimantan, P. Sebatik, P. Pisang, dan P. Timor berbasiskan perjanjian perbatasan bersama.

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3. Keputusan Presiden Nomor 42 Tahun 1971 tentang Persetujuan antara Pemerintah Republik Indonesia dan Pemerintah Commonwealth Australia tentang Penetapan Batas-batas Dasar Laut Tertentu.
4. Keputusan Presiden Nomor 21 Tahun 1972 tentang Persetujuan antara Pemerintah Republik Indonesia, Pemerintah Malaysia, dan Pemerintah Singapura Tentang Garis Batas Landas Kontinen Bagian Utara Selat Malaka.
5. Keputusan Presiden Nomor 31 Tahun 1972 tentang Persetujuan antara Pemerintah Republik Indonesia dan Pemerintah Kerajaan Thailand Tentang Penetapan Garis Batas Landas Kontinen Kedua Negara di Bagian Utara Selat Malaka.
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Introduction

Java sugar and the age of mass production

During the middle decades of the nineteenth century (circa 1830-1880), colonial Indonesia's sugar industry emerged from relative global obscurity to a position in the front rank of the world's manufacturers of the commodity. Sugar production in the Indonesian archipelago was almost totally confined to Java until the mid-twentieth century: for more than two hundred years, the island had been one of many such centres of production of the commodity that were scattered around the eastern hemisphere, across an arc that ran from the Indian subcontinent through to the Ryukyu Islands immediately to the south of Japan. By the early 1880s, however, this situation had changed radically. As a producer-exporter, Java stood at the apex of the international sugar economy, in company with the larger cane sugar industry of Cuba and a trio of (likewise larger) northern European beet sugar producers – Imperial Germany, Austria-Hungary and France. As such, it far outclassed any of its erstwhile Asian counterparts. Around 1830, Java's production of the commodity amounted to only a little over 6,000 tonnes, whereas by 1881 it had risen to 288,000 tonnes. This was in excess of 8 per cent of the world's recorded production of industrially manufactured, 'centrifugal' sugar (Cuba's was over 14 per cent) – and twice that percentage in respect to cane sugar production alone.[1]

Even so, colonial Indonesia's position in world markets was far from secure. Toward the close of the nineteenth century, the international sugar economy was drawn into what has been aptly termed a dawning age of industrial mass production. Its central features were major innovations in metallurgy (cheap steel), transportation (mass, low-cost freight) and motive power (electricity and the internal combustion engine).

[1] Data on Java sugar production (for 1830 and 1881) from Creutzberg 1975: Table 7, and for recorded world production (1880-1881) from *World sugar economy* 1960:21, Table 1.

Together with the science-based technologies likewise associated with the 'second' industrial revolution that reached its apogee around 1914, these developments transformed the observable characteristics of the world production and trade in sugar: continuous throughput, ongoing advance in the science and technology of production and a constant preoccupation with economies of scale became the order of the day.[2]

Under these radically changed conditions, sugar became very big business indeed. It did so, moreover, in conjunction with an increasing demand for the commodity – not only in the West, but also in much of Asia. In particular, a mass global market emerged for sugar that was both white and industrially manufactured: the kind of sweetener, in short, that had hitherto been largely confined to Europe and North America and to wealthier consumers. In close association with these changes in taste, the age of mass production came to be defined not only by massive, high-tech sugar factories, but also by equally massive refineries, the prototypes of which appeared almost contemporaneously in New York and Hong Kong during the course of the 1880s. Sugar had become a commodity manufactured and subsequently refined to a common standard, and traded at a 'world' price telegraphed around the globe by a handful of brokers in London and New York.[3]

On the face of it, however, colonial Indonesia's chances of successful adaptation to the new requirements and opportunities of the age of mass production were poor. The spectacular rise of sugar in Java over the preceding half a century had a quite singular character that might well have foreclosed on the possibility of further advance. In the first place, the industrial project had been fostered in a unique, agrarian context that appeared to set limits to its further expansion. Secondly, the capitalization of production had taken place in a fashion which appeared to have a finite capacity to sustain the financial requirements of the age of mass production. Thirdly, the overall location of Java sugar within the colonial state and, in turn, that state's location within systems of international commerce, seemed anything but promising for the future of 'Big Sugar'.

2 See, in particular, Dye 1998:1-4, 10-4.
3 Albert and Graves 1984:1-8.

STEAM AND STEEL IN THE GARDEN OF THE EAST

Above all else, the story of sugar in colonial Indonesia between 1830 and 1880 had been one of an industrial 'project' grounded in steam and steel – contingent and, to an extent, unplanned, but a 'project' nonetheless. The essential dynamic here was related to the nineteenth-century reinvention of the sugar industry, a reinvention resulting from the industry's position on the cutting edge of the 'first' steam-powered and metallurgy-based industrial revolution. The connection had begun in the 1780s, with the harnessing of steam engines to the mills that ground sugar cane for its juice. Over time, steam power both sped up the process exponentially and rendered it a great deal more efficient in terms of rates of extraction.[4] Nonetheless, the crucial developments in the nineteenth-century revolution in sugar manufacture related less to the crushing process per se than to what happened to raw juice after it had been expressed from the cane. It was here that advances in metallurgy, machine technology and chemical science really came into their own. Together, they were manifested in a series of inventions that enabled cane juice to be clarified and condensed to near-solid state, using steam heat under reduced air pressure in closed pans of an increasingly complex and sophisticated kind. The two key devices were the vacuum pan and, subsequently, the so-called multiple-effect apparatus. These did away with the old, 'rule-of-thumb' uncertainty of the open-pan manufacture (in which sugar was boiled into near-solid state over direct heat) that had previously reigned supreme, in one form or another, in sugar manufacture worldwide. From the 1820s onward, these new steam-and-vacuum methods were taken up in metropolitan refineries (for which they were initially developed) and by raw-sugar makers in the colonial periphery. They were also adopted by an emergent European beet-sugar industry that was soon engaged with its cane counterpart in a competition for markets.

Among the great global commodities, sugar is unique in that it came to be produced in entirely disparate regions of the world from totally different raw materials. In the form manufactured from cane, sugar has a long history. Its origins were in south China and the Indian subcontinent, and its manufacture began in the West in, perhaps, the thirteenth

4 For the discussion in this and the following paragraphs, see Deerr 1949-50, II:534-95; Galloway 1989:120-42; Leidelmeijer 1997:39-68; Curry-Machado 2011:23-47; Bakker 1989:15-26, 135-63; Munting and Perkins 2000.

century (where it was taken up from the Arab civilizations of the Fertile Crescent) and subsequently spread from the Mediterranean via the Atlantic islands into the New World. Beet sugar is of very much more recent origin. Promoted in France during the Napoleonic wars as a substitute for the sugar whose entry into Europe was impeded by the British blockade, beet sugar really took off as a commercially viable product several decades later. Beet was not simply a rival of cane, however. The particular exigencies of its production – and the new industry's location relatively close to the hubs of Europe's metallurgical revolution – had the effect of forcing the pace of the industrial project worldwide.

These developments in the international sugar economy lay at the heart of the nineteenth-century transformation of sugar manufacture in colonial Indonesia. To be sure, the island of Java was not the only place in Asia where the industrial project in sugar was essayed during the course of the nineteenth century. It was, however, the only location in which it was both launched and successfully carried through over a period of more than half a century. Promising starts elsewhere ground to a halt in the Indian subcontinent (only to be spectacularly revived in the twentieth century);[5] slowly sank into obsolescence in Mauritius, which had once been an industry leader in the region;[6] and failed to reach their undoubted industrial potential, as in the Philippines, where an important 'pioneer' industry had (temporarily, as it turned out) literally and figuratively run out of steam by the century's closing decades.[7] Elsewhere in

5 For sugar production in the Indian subcontinent during the early and mid-nineteenth century, see, for example, Amin 1984:32-80; Marshall 1987:5-22, 34-9; Ratledge 2009.

6 According to North Coombes (1937:124), in 1862 some 56 of the island's 300 factories had installed vacuum pans and most of these operated with centrifuges. Deerr (1949-50, II:561-2) says that the first vacuum pan was installed there in 1844. Leon (1848), writing in the late 1840s, remarked that Mauritius was the only British colonial plantation known to him 'where the modern process of making sugar has tolerably succeeded'. For Mauritius in general, see, for example, Allen 1981. By the 1870s, the Mauritius industry had entered a long period of stagnation and had ceased to be a major producer in world terms (though it continued to supply substantial quantities of the commodity to Indian markets). Indeed, by the century's end its factories were authoritatively described as antiquated museum pieces. See Noel Deerr, as quoted in Prinsen Geerligs 1904:1328.

7 On developments in sugar production in general in the Philippines during the course of the nineteenth century, see, for example, Aguilar 1998; Larkin 1972; McCoy 1982. According to Deerr (1949-50, II:562) a couple of vacuum pans were first installed in the Philippines in 1879. Other sources, while indicating steam mills, have nothing to say about vacuum pans or multiple effect before the early twentieth century. In 1890s the Negros industry's foremost apologist lamented that a system of industrialized *centrals* (that is, a system of production in which cane grown in a variety of locations is manufactured into sugar in large central factories) had yet to appear, arguing that it was 'because of his lack of capital' that the planter-manufacturer of Negros was forced to adopt 'quick and simple methods' which produced only a low grade of muscovado sugar from the excellent raw material available to the mills (Echaúz

the immediate region, attempts to produce sugar on an industrial scale on the Malay Peninsula petered out around 1900, in response to the better prospects of rubber and competition from cheap imports.[8]

These varying degrees of failure elsewhere in Asia left the colonial Indonesian producers largely on their own. The vacuum pan had made a precocious appearance in Java in around 1830,[9] but it was almost another twenty years before it began to establish a substantial presence on the island. Despite this late start, however, by the late 1850s Java was not so very far behind world leader Cuba in respect to the number of steam-operated installations in its factories' boiling houses.[10] Also very much like its Caribbean counterpart, moreover, mid-nineteenth-century Java's sugar industry mixed up-to-date equipment with the old and the 'obsolete'. In common with other leading sectors of the international sugar economy, however, during the 1870s the industrial project in colonial Indonesia began to take on a new coherence, associated with the installation of the fully fledged version of the multiple effect apparatus (its origins went back to the 1840s), and, with it, a decisive shift to fully industrialized, continuous operation.[11] By the mid-1880s, the Java industry had already gone far enough down this road of technological progress to substantially bolster its ability to survive the global commercial crisis that struck the international sugar economy at that time.

1978:61). 'It is an astonishing fact', remarked an early twentieth-century American investigator, 'that so little attention is paid in Negros to the importance of skill and care in the manufacture of sugar, even by the present crude methods.' He estimated that not more than one plantation-owner in twenty was fully conversant with the sugar-manufacturing process (Walker 1910:111-2).

8 Hollen Lees 2007.

9 John Pitcairn (administrator of the P&T estate in West Java) to Van den Bosch, 14-8-1830, in: Nationaal Archief (NA), The Hague, Collectie 115 J. van den Bosch, 1627-1914, toegangsnummer 2.21.028, inventarisnummer 426. '[…] I am anxious to inform your Excellency that a machine lately invented in England for boiling sugar by steam has been sent out to me, which will likely arrive in the course of this year. It possesses many advantages over the present mode of boiling sugar […].'

10 According to data collected by Leidelmeijer (1997:138), nearly 60% of the colony's 96 contract sugar factories (56 in all) were equipped with vacuum pans circa 1857. There were around 56 such factories equipped with vacuum pans of one kind or another, whereas in Cuba at around the same time 77 factories were similarly equipped. See Curry-Machado 2011:29, note 21, 208. He states that 32 of these factories were equipped with De Rosne apparatus (from the great French-Belgian manufacturer) and that 20 were equipped with 'Rillieux [proto-type] Multiple Effet'. He also points out that the majority of Cuba's sugar factories were not equipped with vacuum pans at this date.

11 Initially designed, like the vacuum pan before it, for operation in refineries, the multiple-effect apparatus was originally considered far too bulky and expensive for use in raw-sugar production. Nonetheless, that is precisely where it began to appear, in rapidly increasing numbers, from circa 1870 onward. On this point, see Deerr 1949-50, II:562-72; Soames 1872:58; Lock, Wigner and Harland 1882:269-73.

Indeed, it was in respect to the adoption of the multiple-effect apparatus that colonial Indonesia's lead in matters of technology over any other Asian sugar industry became decisive. With a few exceptions in the Indian subcontinent, there is little evidence that apparatus of this kind made their appearance in raw-sugar factories elsewhere in Asia prior to the twentieth century. Given the existing strength of their industrial manufacturing base, by the closing decades of the nineteenth century colonial Indonesia's producers were uniquely positioned among Asian producers to exploit the possibilities of the mass market for the industrially manufactured ('centrifugal') form of the commodity that was opening up throughout the East. Indeed, their sole competitors in this market were not from Asia at all, but from the great beet-sugar-producing areas of northern Europe.

SUGAR WITHOUT PLANTATIONS: THE JAVA SUGAR COMPLEX AND THE CULTUURSTELSEL

Similar advantages, however, did not accrue so unequivocally in respect to the agrarian foundations of production as they did in respect to manufacturing. These foundations were a legacy of the *Cultuurstelsel*, the 'system of [state] cultivations' that had so dominated the formative phase of the industry's modern history.[12] Under the *Cultuurstelsel*, an industry had developed based on nearly one hundred (mostly) new-built factories scattered across the densely populated lowlands of East and Central Java (a significant number of factories existed outside the *Cultuurstelsel*, particularly in the principalities of South-Central Java, but the bulk of production came from enterprises working within it). The group of concessionaires that was contracted to run these factories under the auspices of the *Cultuurstelsel* was comprised of local or expatriate Europeans (most of them Dutch) together with a minority of Indonesian-Chinese (there were no Javanese among their ranks).

The sugar complex in which the contractors' operations were embedded, courtesy of the *Cultuurstelsel*, was an entirely singular one. The 'sugar plantation' as conceived in the heavily Caribbean-centric literature on the international manufacture of cane sugar did not exist in Java; nei-

[12] The most notable recent scholarship includes Elson 1984, 1994; Soetrisno 1980; Fernando 1982; Suryo 1982; Knight 1993; Van Niel 1992; Van Baardewijk 1993.

ther did slavery, nor the indentured forms of labour that later (in part) supplanted it in the New World and elsewhere. Instead, there existed in Java under the *Cultuurstelsel* a different kind of servitude, imposed on a settled peasantry whose land and labour was commandeered by the state. Rather than 'expropriating' Java's petty rural producers in pursuit of the development of large-scale commodity production (in other crops as well as sugar) the *Cultuurstelsel* sought to keep the peasantry 'intact' through a system of crop rotation (Dutch: *wisselbouw*) that saw cane alternated on existing village farmland with rice and other 'peasant' crops.[13]

In fact, it did not really work out that way. Although building on a legacy of labour service and crop-levies inherited from the pre-colonial state, mid-century developments saw the moulding of a specifically 'colonial' peasantry out of an earlier, altogether more amorphous, rural social and economic order. One of its features, very relevant to the expansion of large-scale sugar production, was the increasing presence within peasant society of a group with little or no land that was – notionally at least – 'available' for the kind of seasonal workforce that the industry required, without the need to resort to outright coercion. In this important sense, the 'servitude' imposed by the *Cultuurstelsel* was gradually being transformed well before the system itself was phased out as far as cane growing was concerned during the course of the 1880s. Nonetheless, the essential feature of the sugar complex exploited by Indonesia's colonial sugar producers was – and remained – the fact that cane, far from being a monoculture carried on (largely) in the absence of other significant cultivations, was solidly located within the cycle of 'peasant' agriculture that constituted the core of the much larger 'peasant' economy in which sugar was located.

From some perspectives, of course, this was no bad thing. Above all, it brought the industry into close proximity with labour, while having the added bonus of making existing, irrigated farmland available to Indonesia's colonial sugar producers without the need for the time-consuming and expensive clearance of virgin soil. Undoubtedly, in tandem, these were the key agrarian factors that had underpinned the industry's spectacular mid-nineteenth- century growth. Yet, the ostensibly favour-

[13] This system of land usage, one that distinguished Java from virtually all other major sectors of the international sugar economy, means that the term 'sugar plantation' as used throughout this book refers not to enclave-style cultivation but, instead, to an entity created through the temporary amalgamation of scores of peasant rice fields into a complex more suitable to the raising of cane.

able situation had a serious downside. Above all, it threatened to put tight limits on expansion. On an island that was becoming as closely packed as Java, land was not an inexhaustible resource (as it appeared to be, for example, in relatively lightly populated Cuba), so that in this sense at least the sugar 'frontier' in much of Java appeared inexorably to be closing. Moreover, even labour, notionally so abundant and becoming ever more so, was far from being exclusively at the sugar industry's disposal. Other, competing demands existed for it, both within and without the 'village world'. The agrarian problem, however, was not the only one confronting the industry's bid to transform itself to meet the requirements of the age of mass production; where the money would come from was another.

THE FINANCING OF PRODUCTION: THE COLONIAL STATE AND THE 'INDIES' BOURGEOISIE[14]

The availability of capital was always an issue for an industry dependent on the resources of a minor and, for much of the nineteenth century, relatively impoverished colonial power. Not surprisingly, therefore, the mid-century industrial project had been financed largely from within the colony itself. Indeed, the *Cultuurstelsel* itself had been a device to substitute (forced) labour for capital in a bid to develop the colony as a paying concern for its Dutch masters, with the sugar industry as a major beneficiary. Where direct funding was required (to buy machinery and the like) it had initially been supplied by the state through low-cost capital loans to the contractors from the Indies treasury. Thereafter (from circa 1850 onward) a nascent 'Indies' bourgeoisie, spawned by the contract system that lay at the heart of *Cultuurstelsel*, took over the financing of the project, its (literal) fortunes bolstered by the low-cost access to commandeered rural resources that were written into the concessions granted by the Indies government.

Composed of contractors and their associates in the colony's leading mercantile houses, and predominantly Dutch, Indies-Dutch, British and Indonesian-Chinese in terms of ethnic composition, this Indies bourgeoisie enjoyed close social ties – and, in all probability, illicit financial dealings – with a 'porous' state bureaucracy. Far from being divorced or

[14] For a detailed argument on this score in this and the following paragraph, see Knight 2007.

isolated from the 'mother country', moreover, the Indies bourgeoisie's Dutch and Indies-Dutch constituents maintained close links with their metropolitan counterpart that afforded them a vital source of power and influence.[15] More than coincidentally, moreover, for two decades or more the industrial project in sugar took place in close partnership with the local branch office, or *Factorij*, of the state-linked Nederlandsche Handel-Maatschappij (NHM). A commercial and financial enterprise established in the Netherlands in 1824 under royal patronage, and notionally very much a 'metropolitan' affair, it had been thoroughly infiltrated at the Java end of the business by the local bourgeoisie. Along with the NHM, other participants in the venture were a small number of Dutch companies, who provided a modest amount of finance, generally though the agency of Indonesian-based partners. For the most part however, the industrial project was self-financed by the people who ran it or who benefited from it commercially.

This was all very well, and served the industry reasonably enough, as long as the capital requirements of the industrial revolution in sugar remained relatively modest, and the profits to be had from the sale of the commodity remained relatively high. When world sugar prices tumbled in the mid-1880s, however, and as the cost of the constant technological updating required by the exigencies of mass production continued rising, the outlook was rather bleak for industries that for decades had remained largely financially autonomous. It was no accident, for example, that around this time the Java producers' counterparts in Mauritius began their slide into obsolescence, or that, only a little later, the Cuba producers began to rely heavily on American capital. For a variety of reasons, the Java industry was not similarly attractive to international finance. Nor, indeed, did it seek to attract it, despite the fact that it enjoyed only limited access to the capital of a metropolitan country whose investors were famously inclined to look beyond the confines of their own empire for profitable fields of investment. Moreover, further darkening the situation, the industry's commercial outlook was not exactly inspiring – or so it might have seemed.

[15] In this context, as in others, once-current notions of the 'isolation' of the mid-nineteenth-century Indies need to be discarded. See the seminal work here of Bosma (2007a, 2010), particularly. For a general, somewhat earlier discussion, see Knight 2001.

JAVA AND THE WORLD MARKET FOR SUGAR

The mid-nineteenth-century Java industry had grown up in a highly protected commercial environment, in which, until the 1860s, much of its output found a contractually assured buyer in the Indies state. Indeed, two decades earlier, the fact that the government bought up the bulk of its output at a previously agreed fixed price saved the industrial project from almost certain extinction during a prolonged slump in the market.[16] Though this form of state support had ended during the 1860s, it remained the case that Java's industry had grown up in its modern form insulated from the direct effects of the world market to an extraordinary degree.

The longer-term problem with Java sugar's commercial outlook, however, was that it faced mounting competition internationally from its great Caribbean rival – and from the burgeoning beet sugar industry of northern Europe – while having no metropolitan market worth mentioning. The allegiance of Dutch consumers was to their own beet sugar industry and, being Dutch, they were anyway far more parsimonious with sweetener than their contemporaries across the North Sea in Britain, where the proletarian masses (their womenfolk in particular) gained a grossly disproportionate amount of their calorific intake from foods heavily laden with cheap sugar.[17] No such temptations faced the largely artisan and peasant working-population of the mid-century Netherlands. Along with its unpromising commercial prospects, moreover, colonial Indonesia's sugar producers had also to contend with their industry's complex – and potentially confronting – location in Java's historically very specific form of 'colonial state.'

THE STATE THEY WERE IN

A successful transition into the age of mass production was also contingent, it might be posited, on the existence of a state substantially in thrall to Big Sugar, and on marketing arrangements underwritten by (quasi-) colonial-imperial ties. Cuba's place in an American sugar 'empire', in which a client regime was dominated, however uneasily, by a sugar in-

[16] Fasseur 1992:86-91.
[17] Mintz 1985:127, 133-45.

terest whose operations were contingent on the existence of secure mass markets in the United States, again exemplified the new age to perfection. In Java, a very different situation prevailed. Holland's colonial empire not only lacked an internal market for Java's output of sugar, but was also devoid of the imperial clout that might have secured one elsewhere. In Indonesia itself, moreover, a considerable taste for sweetness was catered for largely by indigenous production of brown sugars of one kind or another. White, factory-made sugar had only a tiny outlet there. In combination, these factors left Java sugar dangerously exposed in world markets where tariff barriers, preferential duties and 'hidden' subsidies were the order of the day.

To be sure, it might be argued that although, in the Indonesian case, the colonial state was in no position to provide Big Sugar with the degree of commercial security that was expected of it in most other major sectors of the international sugar economy, it could compensate for this in other ways. In particular, it might ensure that production costs were kept to a minimum, above all by enforcing 'privileged' access to land and through underwriting the recruitment and disciplining of labour. In an important sense, this was indeed the function it had fulfilled in the heyday of *Cultuurstelsel* – and this was a legacy that undoubtedly persisted. Even so, the colonial regime that controlled the island became over the years decidedly equivocal in its attitude to sugar capital. By the late nineteenth century, a powerful bureaucracy with heterogeneous agendas and interests existed in a conflicted relationship with Big Sugar that was part supportive but also part restrictive. What would nowadays, however fatuously, be termed 'sovereign risk' (that is, the degree of political uncertainty surrounding capital investment) hence seemed perhaps rather high – despite the *Pax Neerlandica* that the Dutch (largely) succeeded in imposing on Java from the 1830s onward.

SUGAR'S LATE COLONIAL TRAJECTORY: SURPRISING OUTCOMES AND KEY EXPLANATIONS

Over the course of less than fifty years, the Southeast Asian outpost of a small and economically backward European power had emerged, in terms of technological advance and sheer output, onto the front rank of the international sugar economy. Nonetheless, it did so within a context

that left the future very uncertain. Any one of the factors just listed might have sidelined Java as a major global producer. Combined, they ought to have been fatal. Yet, they were not: instead, with the advent of the age of mass production, late colonial Indonesia's sugar producers consolidated rather than surrendered their position as one of the world's leading sugar industries. Indeed, the period from circa 1880 up to the late 1920s proved to be the time of considerable expansion. From a total production just shy of 300,000 tonnes in the early 1880s, Java's output increased tenfold to a peak of 3 million MT in 1931.[18] Astonishingly, this represented around one-fifth of the world's recorded production of cane sugar and (potentially, had they been able to sell it all) around one quarter of the sugar (cane and beet combined) entering international trade.[19]

This book sets out to explain how this remarkable feat – the transformation of an industry that developments threatened to consign to the margins of the international sugar economy into one of its star performers – was brought about. Its analysis moves through several key stages. First, it argues that Indonesia's late colonial sugar industry 'survived' the onset of the age of mass production because new markets opened elsewhere in Asia late in the nineteenth century. A second explanation is of equal importance, however, in that the industry was only able to take advantage of this situation because of radical developments in the agricultural sphere of production in Java itself. The book goes on to argue, nonetheless, that this latter development was far from plain sailing. One factor was the industry's long and ambivalent encounter with the colonial state, while a second was the changing and (for Big Sugar) challenging agrarian context to which the industry had to accommodate itself. The two were interlinked. A third complicating factor was the singular – even idiosyncratic – fashion in which the industry financed its late colonial expansion.

[18] The broad statistical picture of key aspects of the expansion of sugar production in Java from 1880 until 1940 – relating to quantities produced, area under cane, prices – appears in Appendix 1.

[19] Based on data from Creutzberg 1975:Table 7; H. Prinsen Geerligs and R. Prinsen Geerligs 1938:51; *World sugar economy* 1960: Table 6.

THE CRISIS OF 1884 AND THE 'ASIAN CONNECTION'

The book begins by drawing attention to the vital importance of the 'Asian connection' that the Java sugar industry developed from the late nineteenth century onward. Largely deprived of its 'traditional' markets in the West by competition from beet sugar in Europe and revived Caribbean cane output in the New World, Java found its commercial salvation in becoming the largest single supplier of factory-made (that is, centrifugal) sugar to consumers and refiners in its own Asian 'hinterland'. This development is widely acknowledged in the relevant literature. Rather less attention, however, has been paid to the context in which it took place. The fact was that changing patterns of sugar consumption in East Asia and the Indian subcontinent, which underpinned colonial Indonesia's 'Asian connection', were themselves closely bound up with the dramatic fall in the world sugar price for 'centrifugal' sugar in the mid-1880s, which made this form of the commodity 'available' on Asian markets as never before. What was striking in this context was the ability of Indonesia's colonial sugar producers to reduce their costs – and greatly increase their output – to enable them to exploit this novel situation.

THE FERTILIZER REVOLUTION AND AGRO-INDUSTRY IN THE FIELD

First and foremost, they were able to do so because of developments in the agricultural sector of production. Colonial Indonesia's sugar *factories* continued to build on the technological advances achieved in earlier decades, but it was what happened in the cane *field* that was crucial. The industry overcame the inherent disadvantages of its location (on an island where arable land was becoming increasingly scarce) through the intensive use of fertilizer as a 'land-substitute' and through transmuting massive labour inputs into an industrial-style, minutely supervised agricultural workforce, in which women played as crucial a role as did men. Allied to a sophisticated research programme these two developments in tandem formed the basis for a unique, highly evolved agro-industry of cane that was without equal in the international sugar economy of the day. Most obviously, its achievement showed up in uniquely high levels of field productivity.

BIG SUGAR AND THE COLONIAL STATE

One of the key factors complicating the narrative of the industry's expansion in the age of mass production, and the agro-industry in the field on which it was based, was Big Sugar's nexus with the colonial state. In the circumstances of late colonial Indonesia, and of Java in particular, any idea that the state was little more than the 'handmaiden' of sugar capital is seriously wide of the mark. Primarily, this was because the 'colonial state' (and, for that matter, sugar capital), was far from being a homogenous entity. Big Sugar consequently found itself drawn into the conflicting agendas of a heavily bureaucratic regime, sections of which saw themselves committed to 'the peasantry' in ways that conflicted with the industry's interests. Nonetheless, the situation was very fluid.

NO BUSINESS LIKE SUGAR BUSINESS

To some degree, the capitalization of the large-scale commodity production of sugar in late colonial Java may have reflected an element of 'sovereign risk' inherent in Big Sugar's relations with the state. Predominantly, however, the financial strategies of the colony's major sugar companies were driven by a different set of priorities. Indonesia's colonial sugar industry was less profitable for its shareholders than has sometimes been presumed. Not least, this was because the companies pursued a strategy of financing expansion out of (withheld) profits to a degree that was remarkable, even in a colonial context such as this one, in which 'self-finance' of this kind was by no means uncommon. From one perspective, this meant that expansion was hamstrung by very conservative investment policies; at the same time, however, those policies reflected an appreciation of how circumscribed the opportunities for expansion actually were.

ENMESHED IN LILLIPUT

By the early 1910s, the outlook for Big Sugar in Java seemed increasingly gloomy. In terms of field productivity, in particular, the industry had arrived at a plateau and further attempts at expansion seemed likely to

be negated by the constraints imposed by its socio-economic setting in the heartlands of rural Java. Enmeshed in Lilliput – the miniscule and myriad world of Javanese peasant agriculture – the industry appeared no longer capable of a continuing response to the exigencies of mass production and to the ever-expanding possibilities of Asian markets. Labour was restive, conflict with peasant-landholders was endemic and – if that was not enough – the fertilizer revolution had reached the limits of its potential. The gravity of the situation was compounded by the impact on the industry's workforce of the 'Spanish' influenza at the end of the First World War, and the increasing concern of the colonial government that the engrossing of land for sugar cane was leading to food-shortages.

NO ESCAPE: THE HVA AND THE DJATIROTO PROJECT

From the viewpoint of some of Big Sugar's more aggressive executives there was no reason why the industry should succumb to these ostensible imperatives. In the 'remote' far south-east of Java, the big, Amsterdam-based HVA company built an entirely new sugar complex, well away from entanglements with the island's settled peasantry, its labyrinthine systems of landholding, and the complex and demanding requirements of its cycle of agriculture. It was all very grand and self-evidently linked to early twentieth-century ideas of 'modernity', but the venture also proved very expensive, and in terms of productivity and profits seems hardly to have been worth it – and possibly worse than that. There was, it transpired, no escape from Lilliput.

MAKING THE BEST OF IT: THE TWENTIES AND THE APOGEE OF BIG SUGAR

During the course of the 1920s, the industry found solutions to what had appeared intractable problems. Changing agrarian conditions, reinforced by a new degree of commitment to Big Sugar on the part of the state, combined with dramatic horticultural advance to ensure that during the decade prior to the onset of the interwar depression of the 1930s the industry was able to resume an expansionary trajectory. By 1930, Java was producing (much) more and cheaper sugar than it had ever done, as field

costs (which had threatened to spiral out of control only a decade earlier) were brought down substantially, and a new, exceptionally high-yielding variety of cane, developed by the industry's own researchers, took over in the plantation. The upshot was that, by 1930, productivity had reached a historic high and the industry was manufacturing almost twice as much sugar as it had done ten years earlier. The only trouble was that (almost) nobody wanted to buy it.

COMMERCIAL NEMESIS: JAVA, JAPAN AND THE RAJ

In tandem with the economic autarchy elsewhere in Asia that accompanied it, the interwar depression nearly did for colonial Indonesia's sugar industry. The commercial strategy that had underpinned its growth since the beginning of the century fell apart. Java's key markets in East Asia and the Indian subcontinent evaporated, causing the closure of the majority of its factories and the permanent loss of around 50 per cent of its productive capacity. Even so, this was not a total collapse. Partial revival began in 1936, and at the beginning of the 1940s, on the eve of Japanese invasion of Indonesia, the Java industry still counted itself – however problematic its commercial outlook – among a small, select group of the world's largest producer-exporters of sugar. The Second World War made an end to that: Java would never again be a significant exporter of sugar to the world market. As will be explained in the book's postscript, however, that did not mean the end of the industry.

Chapter 1

A new epoch

The Asian connection

In 1884, Taikoo sugar refinery opened its doors for business in the British colony of Hong Kong, operated by the ubiquitous 'China coast' firm of Butterfield and Swire.[1] They were following in the footsteps of their longer-established rival, the firm of Jardine Matheson, who had established a similar operation in Hong Kong almost a decade earlier.[2] Taikoo, however, was a more ambitious project. Designed to outflank Jardine's China Sugar Refinery (CSR), it was a harbinger of the age of mass production that was opening up in the international sugar economy. Based, inter alia, on large-scale operation, continuous throughput in the manufacturing process and a constant drive for technological-scientific improvement, the new age was characterized not only by huge new plants for making 'raw' sugar, but also by equally huge operations for refining it. Taikoo, developed primarily to both supply and stimulate a growing taste for refined white sugar in East Asia, was one of them. For the Java industry in particular, it symbolized the beginning of that 'Asian connection' which was to determine its fortunes for decades to come; for Taikoo took the bulk of its raw sugar, not from its own Chinese hinterlands, but from the Dutch colony, some twenty-days' sea voyage to the south. It was a portent of much larger developments that led to Java's sugar producers being able to replace their rapidly depleting markets in the West with new ones elsewhere in Asia itself.

The Java sugar industry had long enjoyed a connection with Asian markets. Indeed, until the early nineteenth century, the bulk of Java's output of sugar had historically gone to other Asian (or Middle Eastern)

[1] On Taikoo, see Marriner and Hyde 1967:98-112. For recent discussions of Taikoo in the context of business organization, see Cox, Huang and Metcalfe 2003.

[2] *China sugar trade* 1880; S. Brown 1979:195. On Jardines, see Blake 1999; on the firm's early history, see Le Pichon 2006:1-51.

markets rather than to Europe. More than half a century later, and on a far grander scale than in the past, the revival of this connection opened up the prospect of salvation; indeed, not only the prospect but the reality. Whereas in 1880 by far the greater part of Java's exports had been consumed in the West (at that stage predominantly in Europe), some forty years later the vastly increased output of the island's factories – it had grown more than sixfold since the 1880s – went almost exclusively to locations in Japan, China and the Indian subcontinent. The tipping point, however, occurred at the end of 1880s, when, for the first time, the greater part of Java's sugar output went to markets outside of Europe.[3]

On the face of it, the commercial position of the Java producers at the onset of the age of mass production was indeed a parlous one. Above all, they lacked any secure market. The Netherlands itself was a small country, and although the per capita intake of sugar by Dutch consumers doubled in the first two decades of the twentieth century, it remained woefully lower than that of their European counterparts across the North Sea. As late as the 1920s, the British consumed twice as much sugar per head as the Dutch.[4] Worse still: not only did the Dutch not eat enough sugar, but the sugar that they did eat was of the 'wrong' kind. During the second half of the nineteenth century, Holland's own beet sugar producers had taken over the Dutch domestic market for the commodity, virtually to the exclusion of cane.[5] A similar situation prevailed in the Netherland's commercial hinterland in Central Europe, where beet sugar likewise reigned supreme. Worse still, the beet sugar manufacturers of Wilhelmine Germany, in particular, had conquered much of the huge British sugar market that Java had once lavishly supplied. By 1900 successful cane sugar producers generally had either a substantial 'home' market to rely on, or else sufficient imperial clout to secure one elsewhere. Java sugar had neither. In these ostensibly far from propitious circumstances, the Java manufacturers somehow had to dispose of what one contemporary calculated was, by the 1920s, enough sugar to fill a freight train that extended from Amsterdam as far as Naples.[6]

3 Mansvelt 1924-26, II:310-2; Prinsen Geerligs 1912:140-1.
4 Prinsen Geerligs 1923:879.
5 Bakker 1989:27-39.
6 Gonggrijp 1921:5.

THE DUTCH RE-DISCOVERY OF ASIA AND THE COLLAPSE OF THE WORLD SUGAR PRICE IN 1884

The somewhat belated Dutch rediscovery of Asia – they had, after all, been among the first northern Europeans to go there – was reflected in a book published in Amsterdam at the very end of the nineteenth century. Ernst Heldring, already well known in Dutch business circles, had just become *directeur* (CEO) of one of the Netherlands' biggest shipping lines, the Koninklijke Nederlandsche Stoomvaart Maatschappij (KNSM), and was to go on to become a major figure in his country's finance and commerce. His views no doubt reflected a wider appreciation, in both metropolis and colony, of a transformation of the commercial nexus between the Indies and Holland that had begun a decade or so earlier.[7] Central to this transformation was a significant revival of Dutch interest in the commodity trade between the colony and East Asian ports that had been somewhat in abeyance during the mid-century decades. In particular, Heldring saw in a renewal of the 'Asian connection' (not a phrase he himself used) a chance for Java's colonial sugar industry to find new markets to replace those that it was rapidly losing elsewhere.

The critical development here had to do with the crisis that shook the international sugar economy in the mid-1880s. During the course of 1884 the world price for industrially manufactured sugar effectively collapsed. The going rate on the international market fell by as much as 50 per cent in the course of a few months. A long period of secular decline in prices and a worldwide crisis of 'overproduction' (exacerbated by a singularly heavy sugar beet harvest in north-central Europe) created turmoil in the international sugar economy. Many manufacturers, and a good number of sugar traders, were faced with ruin. The situation of the Java industry was no exception. Yet, all was not lost. Although the crisis appeared set to destroy the island's colonial sugar industry, it eventually proved its salvation.

It is here that the orthodox chronology of the late colonial industry's history needs some revision. It has often been assumed that the 'turning point' in the Java industry's fortunes was the Brussels Sugar Convention of 1903, which notionally brought an end to a situation in which beet

7 Heldring 1899. Part travelogue and part scenario for a revived trading connection in 'the East', the book devoted an entire chapter (pp. 167-81) to the Java sugar industry. Ernst Heldring (1871-1954) was *directeur* of the KNSM from 1899 to 1937, and subsequently CEO of the NHM (1939-1948).

sugar had been so heavily subsidized (through a system of bonuses) in its countries of production – primarily Imperial Germany and the Austro-Hungarian Empire – that cane sugar was slowly but inexorably being driven from the world market.[8] As far as Java was concerned, however, this emphasis on 'Brussels' is misplaced. Instead, the key development had taken place almost two decades earlier. It was then, in 1884 (rather than in 1903), that the foundations for the industry's late colonial trajectory were laid, however improbable this may have seemed at the time.

Formulations that hail the Brussels Convention as securing the future of cane sugar production in Java – and elsewhere – hence need to be treated with some caution.[9] To be sure, Java experienced a 44 per cent increase in output in the immediate post-Brussels seasons of 1903-1904 to 1909-1910. As was pointed out at the time, however, this was put into the shade by the increase in output experienced in the years before the Brussels Convention came into force: this amounted to some 58 per cent between 1896-1897 and 1902-1903.[10]

As we shall see in a subsequent chapter, when the Java industry was next hit by a dramatic crisis – in 1931 – it was in effect the result of its exclusion from the Asian markets (above all, in East Asia and the Indian subcontinent) on which it had come to rely almost exclusively. The crisis of 1884 was of a totally different order. Instead of closing Asian markets to Java's colonial sugar producers, it actually opened them. The steep drop in price of industrially manufactured sugar – the factory-made form of the commodity often called centrifugal – made it (potentially) available to consumers for whom it had previously been, at best, an expensive and rare luxury. This was particularly the case in Asia, where newly modern people in newly modern cities were looking for equally modern commodities – white, factory-made sugar among them. Those industrial sugar manufacturers who were able to accommodate themselves to the much lower price for their product prevailing after 1884 could hope to take advantage of this. If somehow they could push down their production costs – and hold them down, because the 1884 fall in

8 For a succinct, 'revisionist' discussion of the convention and its background, see Chalmin 1984. For a discussion of the broader context of the Convention, see Crespo 2006.

9 See, for example, Korthals Altes 1991:17; Bakker 1989:58-9; Tio Poo Tjiang 1923:24-31.

10 Dickhoff 1912. The facts are solidly on his side: Java sugar exports stood at 359,036 MT in 1884 (up from 310,218 in 1883) and had risen to 863,802 in 1902. Production over the same period rose from 401,000 to 897,000. Following that, between 1902-1914 exports rose from 863,802 to 1,488,169 and production rose from 897,000 to 1,405,000 (Creutzberg 1975:74-5).

prices turned out to be permanent – they would be able to enter new and expanding markets. For reasons that will be discussed shortly, this indeed turned out to be the case in Java. Prior to 1884, the island's factory-made sugar was simply too expensive for most Asian consumers – and for industrial refineries, like Taikoo, that were beginning to appear in Asia. It could not compete successfully with the huge local output of 'traditional' handicraft sugar. Following the crisis, however, the situation was very different. Developments on the Hong Kong sugar market from the 1880s onward are a prime case in point.

THE AFTERMATH OF 1884: THE CASE OF THE HONG KONG REFINERIES

The impact in Asia of the drastic drop in the international price of industrially manufactured sugar in 1884 – and its flow-on effects for the Java sugar producers – can be gauged from contemporary developments in Hong Kong and its hinterland in southern China. The British refineries in Hong Kong – Swire's Taikoo and Jardine's CSR – had initially drawn or planned on drawing their supplies largely from the pre-industrial, handicraft producers of sugar in their own hinterland in southern China. Together with neighbouring Guangdong, Shantou (Swatow) was long established as one of the main centres of production in southern China.[11] Hong Kong also drew its supplies, however, from Formosa (Taiwan) and the Philippines, where an old established industry on Luzon was joined in the 1850s by a burgeoning newcomer on Negros.

Though technologically somewhat more advanced than their counterparts in China and Formosa, the output of the Philippines was likewise largely pre-industrial, non-centrifugal sugar – and almost certainly cheaper pre-1884 than its factory-produced Java counterpart. Prior to the crisis, that is to say, the Hong Kong refineries expected to get their stocks of raw sugar from a variety of pre-industrial suppliers: the centrifugal sugar output of Java was at the bottom of their list. In 1880, for example, it was noted that Jardine's refineries 'supply themselves with

[11] For a summary of sugar production in southern China and Formosa in the nineteenth century, see Mazumdar 1998:338.

raw sugar not only from China but also from the Philippine Islands, Cochin China, the Straits Settlements and even from Java'.[12]

The sharp fall in the world price of centrifugal sugar in 1884-1885 changed all this. In Java, the immediate effect, as elsewhere, was to throw the industry into a degree of financial chaos. Commercially, however, it proved a real advantage, in so far as it made the product of the colony's industrialized factory sugar factories much more competitive on the Hong Kong market. Exports from Java to Hong Kong, which had been negligible before 1884, rose steeply. By the end of the 1880s, they ranged between 62,000 and 87,400 MT, and by the middle of the next decade they regularly amounted to 127,000 MT or more annually. In 1900 some 190,000 MT, or well over one quarter (27.4%) of Java's total exports, went to Hong Kong, then virtually the sole direct market in East Asia for Java sugar.[13]

This growing import from Java quickly began to undercut local handcrafted sugar on the Hong Kong market. Indeed, between 1884 and the end of the century, Shantou sugar was virtually squeezed out of Hong Kong, and left to find what sales it could in Shanghai and the Yangzi ports of the interior. The amount of Shantou sugar reaching Hong Kong, which appears to have peaked in 1884 at some 25,700 MT, had fallen by the middle of the following decade to 600 MT or less. Contemporaneously, Jardine's closed down its refinery at Shantou and concentrated its operations in Hong Kong.[14] The difficulties of the Shantou producers were compounded, moreover, by the very expansion of sugar production in Java that the opening of the Hong Kong market made possible.

The problem related to the escalating cost of fertilizer for their cane fields, something to which the Java industry almost certainly made a pronounced (albeit unquantifiable) contribution. Cane field fertilizer in Shantou predominantly took the form of bean-cake (the residue left after the pressing of soya and other beans for oil) and was imported from northern China. Bean cake, however, was also in increasing demand for Java's expanding cane fields, and growing trade in raw sugar from the Netherlands Indies to Hong Kong meant that imports of Chinese

12 *China sugar trade* 1880:492.

13 As Korthals Altes (1991:16) points out, despite the fall in prices in 1884, 'exports of sugar rose very considerably during the entire decade, though there were serious setbacks in 1886 and 1889'.

14 Corsten 1900:301-18; Mazumdar 1998:351.

bean-cake into Java could benefit from relatively cheap freight on steamers that would otherwise return with cargo space to spare. The price of bean-cake in Shantou more than doubled in the decade after 1887, and proportionally less of it was used, leading inevitably to declining yields.[15] In short, the collapse in the world price for factory-made, centrifugal sugar in the mid-1880s was something with 'global' reverberations: in the case of southern China it impacted not only on the market for artisan sugar, but also on the very conditions in which cane itself was produced.

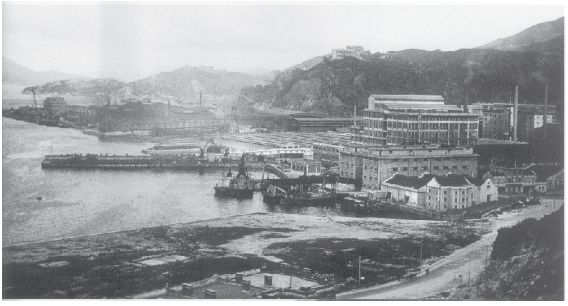
SCALE AND SCOPE: INDUSTRIALIZED SUGAR REFINING IN LATE NINETEENTH-CENTURY ASIA

Sugar refineries are places where raw sugar is reprocessed into a generally whiter, purer and more crystalline form of the commodity.[16] This involves it being melted down in hot water, and then subject to further cleansing and bleaching before being returned to solid form. As such, refining was central to the entire international sugar economy. In the West, the emergence of refineries – in Amsterdam, London, and in the proximity of other major ports in Northern Europe – had been virtually contemporary with the arrival of raw brown sugars from the Caribbean and elsewhere in the New World in the sixteenth and seventeen centuries. Refining also had a long history in Asia, in the Indian subcontinent in particular, as a way of transforming local supplies of crudely produced, peasant-made sugar into a more palatable and commercially viable form. Butterfield and Swire's Taikoo refinery nonetheless represented a new (or almost new) departure in the Asian context, not simply because of the overseas source of its raw material but also – indeed primarily – because of the scale and scope of its operations and the industrial character of its methods. It was, quite simply, the largest of a new breed of large-scale,

[15] On the importance of the trade in oil cake in China itself, where it was likewise heavily used on cane fields in the south, see S. Brown 1981, inter alia, for the importance of the trade in oil cake from soy beans from North China/Manchuria to South China where it is used primarily as a fertilizer on cane fields. The main firms that imported Java sugar into China during this period, Butterfield & Swire and Jardine Matheson, were both deeply involved in this trade, and in soybean pressing at factories on the China Coast. They were presumably the channel through which the Java industry tapped into this manufacture and trade in oil cake in East Asia, and it must have been the boats that took Java sugar to Hong Kong that came back with oil-cake.

[16] For a detailed description of sugar refining in the second half of the nineteenth century, see, for example, Chalmin 1990:48.

industrially equipped refinery that began to make its appearance in East Asia from the 1870s onward: Japan was subsequently to follow its lead.



Butterfield & Swires' Taikoo sugar refinery, one of the largest in the world, Hong Kong, circa 1930

Refineries of this type had their origins in Western Europe during the first half of the nineteenth century. As such, they were closely linked to the rapidly advancing technologies of steam and steel – allied to a great deal of applied chemistry – that characterized the 'first' industrial revolution. Chronologically, their development preceded that of industrially equipped raw sugar factories, where the expressed juice of the sugar cane was similarly processed in steam-heated equipment and under reduced air pressure. Otherwise, the resemblance was striking. In particular, the vacuum pan – the *pièce de resistance* of the new way of doing things – was central to the operations of both refineries and (advanced) raw sugar factories, as were centrifuges and multiple effect apparatus.

Back in Hong Kong – or, more probably, in their London head office – Butterfield and Swire had apparently settled on the name of Taikoo for their new venture because it was said to translate as 'the great and ancient'. As may be imagined, however, there was nothing in the least antiquated about their new venture. In common with the other, rival establishment in Hong Kong, Jardine Matherson's CSR, Taikoo was equipped with machinery from leading UK manufacturers, and both enterprises were on the cutting edge of sugar-refining technology. For example, the Weinrich Process for centrifuging sugar – that spinning process at the end of the production line that separated crystal from molasses – which Jardine used in 1880 at CSR had only been patented six

years earlier.[17] Nonetheless, Butterfield & Swire's venture was specifically designed to outflank Jardine's operations, and reflected the often-bitter enmity between the two firms. From these far from modest beginnings, by the close of the nineteenth century the Taikoo enterprise had become a massive operation. Indeed, its nearest global counterpart was the huge refinery developed, virtually contemporaneously, by the firm of Havemeyer & Elder, on New York's Brooklyn waterfront, and almost certainly the largest in the world.[18]

As such, Taikoo represented a substantial capital investment. Its development was financed by its British owners, by various UK associates, and from investment by Chinese business interests in Hong Kong itself. Precisely how much money was involved is difficult to judge. The refinery initially cost Swire's around 200,000 pounds sterling to build and equip. During the decade and a half following its opening in 1884, however, a great deal more money was invested in expanding the operation. Said to be in the region of 690,000 pounds sterling, the sum included the cost of two steamers to bring raw sugar to Hong Kong and other costs not directly associated with refining.[19] Across the other side of the world, in Brooklyn, Havemeyer & Elder's investment in refining reputedly amounted to nearly 7 million dollars – and hence approaching 1.5 million pounds sterling. Direct comparison is vitiated to a degree, of course, by the presumably much lower construction costs in Hong Kong compared to New York – though the refinery equipment itself would have cost more, once freight and insurance to the Far East was taken into account.[20] An altogether more revealing comparison – and one that gives an insight not only into the extent of Swire's operations in Hong Kong but also into the relative scale of metropolitan and colonial enterprise – is with outlays on sugar refineries 'back home' in the UK. It was

17 *China sugar trade* 1880; Chalmin 1990:48.

18 *New colossal refinery* 1883; Hertzfeld and Bartz 1893; Postal 2007. Around the turn of the century, Henry O. Havemeyer was the greatest of the sugar 'barons' on the east coast of the United States and a key figure in the American 'sugar empire'. Indeed, the Sugar Trust with which he was associated controlled more than 90% of the sugar refined in the United States. For his business interests in general and in the Caribbean in particular, see García Muñiz 2010:14-5, 47.

19 On Chinese capital, see Hao 1986:255: 'The Swire papers indicate that at least six Chinese from different hongs were shareholders [in Taikoo] in 1882 […] the total Chinese investment was […] more than $380,000, a sizeable amount.' On British investors and the total investment, see Marriner and Hyde 1967:100-4.

20 *New colossal refinery* 1883. I have calculated the cost at the rate of the 1883 rate of exchange of 4.85 US dollar = 1 pound sterling.

said that in the 1880s, for instance, the cost of setting up there was 'at least 50,000 pounds sterling'.[21] Not for the first time in the international sugar economy, developments on the so-called 'periphery' outflanked those at the 'core'.

In return for their investment, Butterfield & Swire became the possessors of a state-of-the-art operation at Quarry Bay, on the then outskirts of the British colony. It was operated by a workforce of Chinese 'coolies' several thousand strong (the Havemeyer & Elder refinery in Brooklyn employed around 2,000 people in the 1890s).[22] Details as to how this workforce was raised in the refinery's early days are lacking. By the early 1920s, however, Taikoo was provisioned by a Chinese labour-contractor, one Jack A. Tai, and it may be assumed that some such arrangement was also in force in the late nineteenth century.[23] The great refinery's successful functioning, however, was also dependent on a staff of around one hundred skilled Chinese technicians – fitters, mechanics and the like[24] – and on a group of largely expatriate Europeans, numbering about thirty at the beginning of the 1920s.[25] When Taikoo had begun operations some forty years earlier, a number of these expatriates had been Germans – as indeed was the general manager and former chief chemist, Dr Ferdinand Korn. The refinery's owners, however, were 'inclined not to go in for too many Germans if we can secure really reliable Britishers'.[26] Not that such 'Britishers' were without fault: 'I am satisfied', remarked one of the senior partners in 1889, '[that] Brown… owes his inefficiency to self-indulgence in overeating and still more, I fear, from overdrinking', while commenting that another British expatriate

[21] Chalmin 1990:51.

[22] Precise information on the number of workers employed at Taikoo is currently lacking. The Havemeyer figure for the 1890s is from Hertzfeld and Bartz 1893:364-5. Circa 1919, the New York refinery was said to have 4,500 workers on the payroll (Postal 2007:9).

[23] Butterfield & Swire Hong Kong (hereafter BSHK) to Butterfield & Swire London (hereafter Swire), 23-6-1922, 'Refinery Letters 1922', in: Papers of John Swire and Sons (hereafter JSS + relevant identifying numbers from Elizabeth Hook, *A guide to the papers of John Swire and Sons Ltd*. London: The Library, School of Oriental and African Studies, University of London, 1997) JSSI 1/1.

[24] BSHK to Swire, 21-4-1922, 'Refinery Letters 1922', in: JSSI 1/1. The Chinese engineers formed a guild at Taikoo, and early in 1922, had successfully threatened a walk-off in support of a sacked colleague.

[25] See, for example, Swire to BSHK, 9-11-1922 and BSHK to Swire 22-9-1922, 'Refinery Letters 1922', in: JSSI 1/1.

[26] Scott to Mackintosh, 17-10-1890, in: JSSI 1/9.

was 'a gambler without much principle, and with still less head, but may be a smart clerk'.[27]

The enterprise over which these men had charge was powered by a mighty set of steam boilers, whose consumption of coal – much of it brought from Japan – amounted to nearly 2,000 MT per week at the height of its late nineteenth-century operation.[28] At its heavily industrialized heart, Taikoo boasted a complex of machinery consisting of filters and clarifiers, pressurized condensers, no less than five vacuum pans (Havemeyer and Elder had six – one contemporary account speaks of them as '*kolossale*')[29] and an extensive array of centrifuges. None of its machinery was made locally and, as was also the case with Jardine's China Sugar Refinery, virtually everything was imported from leading manufacturers in the United Kingdom.[30] The tallest part of the refinery was the filter house, built in brick, and at least nine stories high,[31] making it by far the highest building in late nineteenth-century Hong Kong. The boiler house chimney was higher still. Havemeyer and Elder's Brooklyn refinery, rebuilt in brick and steel after a disastrous fire in 1882, ran to 13 stories, with a chimney that rose to over a 155 feet.[32]

Beyond bricks and mortar, of course, what counted in a refinery was its 'melt capacity' (rather than sheer output which, given the nature of the international sugar economy into which refineries fed, fluctuated considerably). Taikoo began in the mid-1880s with a weekly capacity said to be around 700 MT, but by the end of the century this had climbed to a reported 4,500 MT, or some 640 MT per day.[33] There is some evidence that Havemeyer and Elder's refinery had a daily melt capacity almost

27 Scott to Mackintosh, 1889, JSSI 1/9.

28 That is, 'We will want something like 100,000 tons for '97' (BSHK to Swire, 7-10-1896, in: JSSI 2/8). In 1884, at least, coal was expected to come from Japan (Senior to Mackintosh, 4-9-1884, in: JSSI 1/7).

29 Hertzfeld and Bartz 1893:367.

30 For information on the fit-out at Taikoo by 1889 (and the prediction that output at the newly extended refinery would be in excess of 1,600 MT), see Scott to Mackintosh, 15-11-1889, 3-4-1890 and 22-5-1890, in: JSSI 1/9. For Jardine's refinery equipment, see *China sugar trade* 1880: 'the machinery for the [CSR] refinery has been principally supplied by Messers Rankin, Blackmore, Greenock and Messers Manlove, Alliot & Co, Nottingham'. Jardine's second Hong Kong refinery – the Oriental Sugar Refinery – and its Shantou refinery also had equipment supplied by Manlove Alliot.

31 See, for example, the reference in Scott to Mackintosh, 30-3-1890, in: JSSI 1/9.

32 *New colossal refinery* 1883.

33 Marriner and Hyde 1967:102. This seems about right. Some two decades later, at the beginning of the 1920s, without much expansion in the meantime, Taikoo's daily melt capacity was said to be around 9,000 *picul*, or 544 MT, and weekly output around 3,244 MT of refined sugar. See BSHK to Swire, 10-2-1922, Sugar Refinery Letters JSSI 1/1.

double that.[34] Again, however, in some ways the more telling comparison is with metropolitan Europe: Taikoo's late nineteenth-century melt capacity appears to have been well over twice that of a large Parisian refinery of the day, and around six times greater than the average capacity (760 MT per week) of contemporary Scottish refineries on the Clyde.[35]

ESCAPING OLIGOPOLY: THE JAVA PRODUCERS AND OVERSEAS REFINERS

Java's colonial sugar factories had, of course, long been associated with overseas refiners. Indeed, the refining of their sugar in Holland and subsequently in the UK had been the mainstay of their business during the middle decades of the nineteenth century. Until the 1880s, the bulk of Java's exports had gone to markets in the West. Initially, they went largely to Amsterdam, where they fed refineries financed in part by the NHM, the quasi-governmental corporation that played a big part in Java's mid-century sugar trade, and latterly to London.[36] The appearance of major sugar refineries in Hong Kong – and of Taikoo in particular – offered important new possibilities. From soon after its inception, Taikoo generally took the bulk of its raw sugar from the Java factories. Yet, the consequence of this nexus between Java and Hong Kong was not what might be supposed.

Notoriously, by the late nineteenth century colonial, or quasi-colonial, producers of raw sugar found themselves in thrall to metropolitan or other overseas refining interests. This was certainly the case in relation to the great North American sugar refineries (with Havemeyer and Elders very much to the fore) and the sugar producers of the (informal) United States' 'sugar empire' in the Caribbean.[37] Java, however, was different. Indeed, the island's sugar business developed along quite unique lines as far as the refining of its raw product was concerned. Although the

34 *New colossal refinery* 1883. Citing the local newspaper account in the *Brooklyn Eagle* for 30 July 1883, however, Postal (2007:8) says 'daily [melt] capacity was estimated to be 1,200 tons'.

35 For comparisons, see Chalmin 1990:49, 727 note 4.

36 In the mid-nineteenth century, Java sugar was sold primarily in Amsterdam to Dutch sugar refiners (extensively financed by NHM), whose main markets were in the Mediterranean countries and England. As late as 1873, some 90% of Java sugar was still shipped to Amsterdam for refining or re-export. By 1880 only 10% reached Amsterdam (Mansvelt 1924-26, II:198-9, 310-2).

37 See, for example, Ayala 1999.

industry forged connections with a number of major refineries in East Asia – Taikoo was the first of them – the connection did not result in the exclusive backward linkages so typical of the relations between refiners and raw-sugar producers elsewhere in the international sugar economy.

For a variety of reasons the industry escaped the hegemony of overseas refiners. Not least among these reasons was the pre-occupation of Dutch metropolitan refiners with European beet sugar, and the determination of British refiners in Hong Kong to avoid formal vertical integration with their suppliers in the interests of always being able to obtain their raw material wherever it was cheapest – a vital matter for refineries that lacked the grip on metropolitan markets enjoyed by their counterparts in New York and elsewhere in the United States. The Java industry's early twentieth-century relations with Japanese refineries (see below) were somewhat more complex. Again, however, the kind of vertical integration that existed in the Caribbean sector of the American sugar empire was essentially absent from the Japanese-Java nexus. Indeed, its absence resulted in the Japanese refiners being able to cast Java adrift when it suited them in the late 1920s.

Moreover, the colony's sugar producers also remained independent, to a degree, of the big firms – both European and Asian – who largely controlled Java's export trade in the commodity. During the 1880s and 1890s, the export of the island's sugar was predominantly in the hands of three European firms, one of them very old and established indeed and the other two relative newcomers. As far as the sale of raw Java sugar in East Asia was concerned, the most important of them was the Batavia-based firm of Maclaine Watson & Co, which acted in tandem with their closely allied business partners in Semarang and Surabaya, respectively McNeill & Co and Fraser Eaton & Co. The group of companies had all been founded in the 1820s, and during the 1880s became the Java's industry's chief conduit to Taikoo and to Butterfield and Swire, the great Hong Kong refinery's London-based owners. Two other Indies-based European firms were more recent arrivals: Erdmann & Sielcken (founded 1875), and Wellenstein Krause (founded 1882).[38] Both appear to have collaborated, rather than competed, with Maclaine Watson interests.[39]

38 *Wellenstein* 1932; Schmiedell 1924; *First hundred years* 1927.

39 The founder of Wellenstein & Krause, Victor August Wellenstein (died 1887) was the brother-in-law of the heads of both Maclaine Watson (A. Dowie) and Fraser Eaton (Alexander Fraser) (see Fasseur

The Maclaine connection with Taikoo, which began almost as soon as the refinery opened in 1884, proved an enduring one. To be sure, Taikoo was not averse to trying its luck with other Java exporters: in 1898, for example, it cheerfully informed Maclaine Watson that the '*Hupeh* [one of the refinery's dedicated sugar carriers] leaves in a few days for Java, to load a full cargo from your neighbours'.[40] In the long term, however, Taikoo's relation with Maclaine Watson remained close, and extended to dealings between the refinery's British owners (Butterfield & Swire) and the Batavia firm's London office. From sometime in the 1890s onward, for example, Maclaines sent a 'regular wire of quotations' to Hong Kong, and for their part Taikoo was prepared to concede that Maclaines was 'better placed to coordinate big orders quietly… [without] disturbing the market unduly' than were some of the smaller Java operators.[41] It also looks as if Maclaine Watson did considerable business in the export of Java sugar to the Indian subcontinent, through their connection there with Ralli Brothers, one of the largest European commercial enterprises in India – and long-term associates of Maclaine Watson.[42] Nonetheless, neither Maclaine Watson nor their associates had extensive direct holdings in the Java sugar industry (and nor did Taikoo). Maclaines were certainly the proprietors of a number of sugar factories in Java (among them the big Pandji operation in the Oosthoek) and had major financial ties with others. The bulk of the Java industry, however, was in other hands.

By the close of the nineteenth-century colonial European firms like Maclaine Watson were not the only key participants in Java's sugar trade. Several Indies-Chinese firms were similarly engaged. The foremost among them was Kian Gwan, the trading arm of the big Indies-

1989). According to Schmiedell (1924:9), Erdmann's London correspondents were from 1876-1904 the firm of Carl Schutze at 29 Mincing Lane; in 1918 Carl Schutze's long-term partner A.J. Fuller set up as A.J. Fuller & Co, and continued as Erdmann's London Representatives. All these people were closely connected at one time or another to Maclaine Watson.

40 BHSK to Maclaine Watson, Batavia, 15-7-1898, in: JSSI 2/8. Both Jardine's Indo-China Steam Ship Company and Swire's China Navigation Company had steamers plying the route from Surabaya to East Asia around the turn of the century, but only as part of a larger network of ad hoc, irregular sailings. By 1910, however, most of the shipping was done by the Amsterdam-based Java-China-Japan line (founded 1902), operating on contract to the two Hong Kong refineries (Brugmans 1952:40, 58, 80; À Campo 2002:264-74). Within the course of the following decade, however, it were the newly established Japanese shipping lines that came to dominate the trade.

41 See, for example, BSHK to Maclaine Watson, Batavia, 15-7-1898 and BSHK to Swire, 2-6-1897, in: JSSI 2/8.

42 Korthals Altes 2004:201.

Chinese (and multinational) conglomerate known as the Oei Tiong Ham Concern (OTHC), and the Kwik Hoo Tong Trading Society (KHT).[43] Originating in Chinese commercial operations in the north-coast city of Semarang in the 1860s, OTHC also owned a string of sugar factories, one of which (Redjo Agoeng) became one of the select group of Java's largest producers, as well as being the first to go over (1929) to fully electrified operation. Nonetheless, total Indies-Chinese investment in the industry's manufacturing sector (including a number of non-trader owners) accounted for well under 20 per cent of total ownership.[44]

One of colonial Indonesia's leading Chinese business men, circa 1920. Oei Tiong Ham, whom had major interests in the trade in sugar.

OTHC and its Kian Gwan affiliate were to be a major force in the sugar business in Southeast and East Asia for decades to come. During the first decade of the twentieth century, much of Kian Gwan's sugar export to East Asia was shipped on its own vessels, but in 1913 it sold them to a Japanese concern and concentrated its maritime activities within the Indonesian archipelago. At a slightly later date, moreover, the Semarang-based KHT also came to play a major part in Java's sugar trade to Hong Kong and other East Asian ports. In short, by the second decade of the twentieth century Java sugar's position in East Asian commercial circuits was dependent to a marked degree on the involvement of a number of big Indies-Chinese as well as colonial European firms. As we shall see, it was the colony's Chinese firms, pre-eminently OTHC and KHT, rather than European firms, that played the key role in the crucial

43 On the history of these firms, and their Japanese links discussed in the following paragraphs, see Post 1995, 2002; Liem Tjwan Ling 1989; Dick 1993; Claver 2006:292-350; Man-Houng Lin 2001.

44 For details of the Indies-Chinese stake in sugar manufacturing, see Chapter 4.

nexus between Java's sugar industry and the big Japanese refineries that cemented Java's Asian connection.

THE RISE OF FACTORY WHITE

The sugar factories of late nineteenth- and early twentieth-century Java developed in a quite singular fashion for a 'colonial' industry: for them, the stereotypical, bi-lateral ties involved in the processing of colonially produced raw materials simply did not exist. One consequence of this was that the Java producers were singularly free to produce a variety of the commodity that enabled them, in effect, to bypass the entire refining process. Early in the twentieth century, there was indeed considerable debate among industry circles in Java about the feasibility of setting up refineries on the island itself. There were advantages in becoming independent of Hong Kong and, subsequently, Japan, and in the cost-savings involved.[45] However, developments were taking place in the industry that made refining a secondary, though still important issue. These developments had to do with the production of what was called 'factory white'.

By the end of the nineteenth century, this form of the commodity had become a feature of the international sugar economy. Indeed, in the Asian context it was just as important as the new breed of massive refineries, such as Taikoo and Havemeyer. Historically, there were a multiplicity of methods by which raw brown sugar might be whitened without recourse to refining per se – hence New World designations such as 'plantation white' or '*blanco*' – and some of them dated back to well before 1800. In the West, and in its modern form, however, factory white had originated in the beet sugar industries of northern Europe during the middle decades of the nineteenth century. It involved patented processes for bleaching beet juice with chemicals while it made its way along the production line that turned the viscous liquid into a (quasi-) crystalline form of marketable sugar. The result was a commodity that bore a passing resemblance to the product of refineries.[46] As was subsequently the case in Asia, it was aimed at consumers who wanted an industrially manufactured sugar but could not afford the refined version of the commodity.

45 See, for example, the discussion in Kraaij 1903:19-28.
46 Deerr 1949-50, II:579-80.

Early versions of factory white were apt to look and taste rather nasty, and hence were most widely used by the manufacturers of jam (conserves) and confectionary, where their shortcomings could easily be disguised. New or perfected techniques, notably the so-called carbonation process, improved both its taste and appearance,[47] and by the 1870s, particularly in Imperial Germany and Austria-Hungary, the beet industry's '"white sugar mills" were producing granulated and cube forms of the product which were [in contemporary parlance] well received by consumers'.[48] By the close of the nineteenth century, large quantities of factory white produced by the carbonation method in European beet factories were finding their way into world trade – and onto Asian markets in particular.

Factory white, however, took many forms, and it was another version pioneered, it would seem, by Indian Ocean producers on the island of Mauritius, that played an important part in its development as a commodity that found a large market in Asia, particularly in the Indian subcontinent. Anxious to sustain and expand their sales in the Indian subcontinent (European markets had by this time been largely lost to them), around the middle of the century, Mauritian sugar manufacturers had created or perfected a version of factory white designed to allay the (often well-founded) fears of Hindu Indians that bone charcoal and other by-products of the killing of cattle were used overseas in whitening sugar.[49] The Mauritian version was based on various permutations of a long-understood principle of using sulphurous acid to bleach raw sugar during the course of its production, and became the basis for large exports to the Indian subcontinent and (initially) Australia.[50] By the closing decades of the century, however, it experienced strong competition in its main Asian market from factory white imported, initially, from the beet sugar industries of Central Europe – where circa 1900 many factories were given over, largely or entirely, to the production of this *Weisse Waare*.[51] Nonetheless, there can be little doubt that, over the preceding decades, Mauritian output of factory white had been the crucial factor

47 For a brief description of the technique and its origins, see Martineau 1910:56-62.

48 Perkins and Munting 1999:163.

49 There existed a 'common notion of a sugar factory "as a place of horror [...] where unspeakable orgies were celebrated with the blood and bone of the sacred cow"' (Amin 1984:104).

50 On this process, see Deerr 1949-50, II:579-80; North Coombes 1937:129-33; Warnford Lock, Wigner and Harland 1882:218-23.

51 Around 1900 some 43 of the Austro-Hungarian factories are already fitted up to produce factory white (Prinsen Geerligs 1904a:1328).

in spearheading the marketing of low-cost white sugar to large numbers of mostly urban Asian consumers.[52] Factory white, however, was only part of the story.

ASIAN CONSUMERS, WHITENESS AND TASTE

The appearance of sugar refineries such as Taikoo and developments in the manufacture of factory white were both contingent upon – and at the same time, of course, acted to stimulate and shape – a growing demand among various categories of Asian consumers for varieties of sugar other than the 'traditional' handcrafted kinds. It was at various locations in Asia, it will be remembered, that the history of the conversion of sucrose into 'sugar' had begun, so that western-style, industrially manufactured sugar did not exactly arrive in terra incognita. Major centres of manufacture had existed in Asia long before supplies of the commodity from the New World began to trickle and, eventually, flood into Europe between the sixteenth and nineteenth centuries. Along with southern China, the Indian subcontinent was the oldest – and greatest – sugar-producing country in the world, and its output had been drawn into Asian and world commodity circuits from a very early date.[53] By early modern times, indeed, Asia boasted a plethora of greater and lesser manufacturing districts, extending from northern India through to southern Japan, in a great arc of sugar that embraced Bihar, Bengal and Madras, Southeast Asia and its archipelagoes, southern China, Taiwan, the Ryukyu Islands and Kyushu. In consequence, well into the twentieth century, Asians consumed an infinite variety of 'handcrafted' sugars, ranging in colour from off-white and yellow to reddish-brown and black, manufactured by largely pre-industrial techniques, and varying hugely in both taste and texture.

From the late nineteenth century onward, however, the market for sugar began to demonstrate important new traits. Foremost was a growing taste for sugar that was manufactured by industrial means rather than by handicraft techniques – and consequently white, crystalline,

[52] Sugar from Mauritius continued to find its way to the Indian market in significant quantities, but its market share was declining. By 1920 it accounted for less than 16% (Prinsen Geerligs 1924:94).

[53] On China in particular, see Mazumdar 1998:13-59; on early Asian sugar production in general, see, for example, Galloway 1989:11-27.

'hygienic' and, for some of its consumers at least, identifiably 'modern'. Even so, matters were far from straightforward. Contrary to what was sometimes assumed, the Asian market was highly discriminating: sugar had to be of the right kind. Chinese consumers, for example, were said to be unenthusiastic about strongly crystalline sugar, believing that it did not have the sweetening capacity of the more powdery varieties of the commodity.[54]

When the British proprietors of Taikoo observed in 1886 that 'there is no doubt that refined sugars are gradually forcing themselves into the appreciation of native consumers […] once the celestial has learned to appreciate our […] sugars, he will not return to the uncleansed sweet he has taken hitherto',[55] they were demonstrating not only a characteristic hauteur, but also a proper appreciation of a situation from which refineries like theirs might hope to profit. Links between white crystalline sugar and 'modernity', especially a specifically Western modernity, were clearly in evidence. Emulation mattered: among the newly urbanized middle classes, industrially manufactured or refined white sugar had a favourable association with Asia's colonial elites, for whom it was the preferred form of sweetener. In the Treaty Ports of the China coast toward the end of the century, for example, it was reported that 'the Chinese' – or at least those of them who adopted Western ways – 'use sugar for the same purposes as Europeans'.[56] Sugar was consumed, probably above all else, in the form of sweetmeats of one kind or another. More generally, however, the preferences of confectioners may again have been paramount in establishing the market of industrially manufactured sugar. In Hong Kong, for example, in the closing decades of the nineteenth century, a major outlet for raw sugar from Java's industrial factories was in the preparation of preserved ginger, and the Chinese firms involved in its manufacture also played a major part in the sugar trade itself. Indeed, such preserves, along with cakes, were said to be what sugar was most used for, along with the direct preparation of food. Sugared water (*suikerwater*) was also widely drunk, as indeed it was in many European countries, among the better-off classes, both as a treat and as aperients.

54 Corsten 1900:315-6, 391.
55 Scott to J.S. Swire, 12-10-1886, in: JSSI 2/4.
56 Corsten 1900:391.

There were parallel and broadly contemporaneous developments in the Indian subcontinent. According to one early twentieth-century colonial source, 'the better-off (*welgestelde*) natives want a white sugar'.[57] Subsequently often re-iterated, the point emerged in the 1930s in the form of the observation that it was the 'richer classes' who consumed industrially manufactured sugar, and that such consumption was essentially an urban phenomenon.[58] On a number of other counts, however, the sugar market in the Indian subcontinent differed significantly from that prevailing in China and Japan. Distinct from East Asia, there existed a considerable market for sugar refined into whiteness by well-attested, local, artisan methods.

This was *khand*.[59] The existence of *khand* – the subcontinent's own form of refined sugar – perhaps helps explain why there was no late nineteenth-century equivalent in the subcontinent of great industrialized sugar refineries based on the Taikoo model. It may also help explain why an earlier 'industrial project' in sugar there, dating from the 1840s, failed to find many local customers when its export drive to the UK ground to a halt around the middle of the century. This mid-century failure to sustain an industrial project in sugar meant, in turn, that the subcontinent had a rather meagre supply of factories producing industrially manufactured sugar in the decades that followed (a situation that only began to change in the 1920s) and hence provided a rich opportunity late in the century for the oversees purveyors of factory white.[60]

Nonetheless, it looks as if factory white has little impact on the production and sale of *gur*, a crudely made indigenous sugar manufactured in large quantities throughout South Asia. As one late nineteenth-

57 Quoted in Prinsen Geerligs 1904a:1333. For detailed information on Indian sugar production and consumption from the late nineteenth century through to the 1940s, see, for example, Gandhi 1945.

58 G.M. Schuitemaker (Calcutta) to NIVAS (Surabaya), Appendix 5, 6-2-1934, in: NA, Nederlands-Indische Vereniging voor de Afzet van Suiker (NIVAS), 1932-1958, toegangsnummer 2.20.09.03, inventarisnummer (inv. nr.) 382.

59 *Khand* was the work of *khandsari* entrepreneurs, who re-processed *gur* and *jaggery* into an altogether more refined product (Amin 1984:81-8).

60 See, in particular, Ratledge 2009. There were, nonetheless, a number of survivors. At least one such factory, on the (then) outskirts of Calcutta, dated back to the 1840s. It appears to have continued in business by turning its attention to the refining of the commodity (rather than the production of raw sugar), and by the 1890s had come to rely for its raw material on imports from Java and elsewhere. It was and remained a relatively small-scale operation. Most of the other 'steam-and-steel' installations that existed in the subcontinent around this time (in all, they numbered less than thirty) were multipurpose enterprises, geared to both the manufacture of raw sugar directly from cane and the refining of *gur.* Prinsen Geerligs (1912:58-9), drawing on the Indian Government's *Financial and Commercial Statistics* for 1904, lists 28 such establishments, employing a total of 4,600 workers.

century source expressed the matter: 'the poorer classes are exceedingly fond of it, and with wages rising steadily as they are doing, the *Cooly* can afford to treat himself and his family to more and more of the mawkish decoctions and confections in which *gur* plays a leading part'.[61] Factory white does, however, appear to have eventually made big inroads into the market for *khand*. It looks as if, initially at least, some of the various forms of factory white encountered cultural taboos on account of the suspicion, probably justified, that bone charcoal was used in its preparation (which is why the Mauritius producers, as we have seen, strove to produce a form of the commodity than did not suffer from this taint). Possibly because of this, factory white apparently found an important market among the urban deracinated – people who may have had fewer qualms about the extent to which the new product potentially came into conflict with cultural taboos. One report from Bombay in the 1890s, for example, identified a prime market for factory white among the mill hands and other industrial workers, who consumed it in tea and coffee on a daily basis. More generally, however, cultural taboos did not prevent the use by confectioners of 'suspect' foreign sugar to adulterate the 'clean' indigenous product. All in all, it was no accident that, as imported factory white began to take a firm hold on the subcontinent, *khand* production went into a pronounced decline. Inter alia, its producers had to struggle against cheap imports.[62]

FACTORY WHITE AND THE COMPETITION FOR INDIAN CONSUMERS

In the wake of the crisis of 1884 and the steep decline in the price of industrially manufactured sugar that it heralded, the subcontinent's markets became a magnet for industrially manufactured sugar from producers worldwide: according to one authority, in these circumstances, 'imports of foreign sugar, especially beet sugar, registered a phenomenal increase'.[63] Initially, as we have seen, this sugar came from Mauritius. By the closing decades of the century, however, a different kind of factory

61 *Indian sugar industry* 1902; and as quoted in Kraaij 1903:24.

62 By the 1920s, *khand* was said to be almost one-third more expensive (Prinsen Geerligs 1926; Amin 1984:91-2).

63 Amin 1984:89-90.

white, made by the carbonation process, began to infiltrate the markets of the subcontinent. This came from Imperial Germany and Austria-Hungary, the world's largest beet sugar producers. It was the Java industry, however, that not only followed in their wake, but ended by taking the lion's share of the entire market. That did not happen immediately, however, and in the meantime the Java industry was rescued (temporarily) from its commercial difficulties from a most unexpected quarter.

NEW MARKETS FOR JAVA SUGAR: CRISIS IN CUBA AND AN AMERICAN INTERLUDE

There is no more obscure episode in the complex history of the Java sugar industry than the period during which, for the better part of a decade, it became a major supplier to North American refineries. Yet, in terms of the survival of the industry, it was a very important one. Toward the close of the nineteenth century, Java was rapidly losing its hold over the European markets on which it had been heavily dependent during the preceding decades. In Asia, meanwhile, the market for industrially manufactured sugar was neither as developed as it was later to become, nor had the Java industry yet assumed the hegemony there that it was later to enjoy. At this point, rebellion and civil war in Cuba, and United States' intervention there, came to its rescue.

Cuba had formerly out-produced Java as the world's foremost exporter of cane sugar (a position which it had taken over from Brazil in the mid-nineteenth century) and been the prime supplier of the North American market. For much of the 1890s, however, Cuba was a war zone. Revolutionary struggle against Spain culminated in United States' intervention, the sinking of the Spanish fleet by the US Navy, full-scale invasion and a lengthy 'pacification' that turned the island into a de facto client state. For a vital period therefore, in the late 1890s and at the very beginning of the twentieth century, Cuban sugar output shrank dramatically, and Java sugar was much in demand to supply the shortfall. The upshot was quite dramatic. It was remarked in 1898, for example, that the American refineries 'had already indeed secured half the production

of Java',[64] and between that date and 1905, on average some 47 per cent of Java's sugar exports went to the United States.[65]

The situation was, of course, too good to last. One close observer had predicted back in 1899 that Cuba would soon oust Java from its share of the North American market, and had recommended that Dutch capitalists set up a sugar refinery in Shanghai to process Java's output on site in what he assumed would be its major market.[66] The prediction proved to be correct. Once re-investment and preferential duties in the United States got Cuba's industry re-started after 1900, Java's temporary advantage evaporated. By 1908, Cuba was again out-producing the Dutch colony and a combination of discriminatory tariffs and competition from beet sugar meant that by the eve of the First World War, Java had been largely excluded from markets throughout the West – and not just those in Europe. It was also well on the way to losing its previous, substantial market share in the Australian colonies to its south. Instead, the industry had come to rely pre-eminently on the Asian connection, in what sugar company executives were coming increasingly to refer to as '*ons natuurlijke afzetgebied*' (our natural outlet).[67]

THE INDIAN SUBCONTINENT: JAVA'S FACTORY WHITE AND ITS COMPETITORS

Sometime toward the very end of the nineteenth century, in relation to the manufacture of factory white, the Java sugar producers set about quite consciously emulating their counterparts in the beet sugar industries of Central Europe. The production of some kind or other of factory white had begun on the island at a couple of factories during the 1890s, when it appears to have been geared largely to domestic consumption.[68]

64 See the anonymous correspondent quoted in *The International Sugar Journal* 1 (1898), p. 435.

65 See Appendix 2. Main export destinations Java sugar, circa 1880-1940.

66 Heldring 1899:70.

67 For a late instance of this usage, see for example, Jaarverslag NIVAS 1935-1936 (4), p. 23, in: NA, NIVAS, 2.20.09.03, inv. nr. 10.

68 *Wellenstein* (1932:18) refers to some kind of factory white having been manufactured at the Kadipaten and Djatiwangi sugar factories in Cirebon Residency, West Java, sometime in the 1890s, and bought by Indies-Chinese dealers who sold it in both Java and the 'Outer Islands'. Some confirmation of this comes from the Kadipaten factory's own surviving archive, where there is a specific reference (1894) to the making of 'Witte Suiker' [White Sugar] there, in the context of the hope that other sugar factories will not follow suit. See T. van der Ben to J. de Vogel, 20-11-1894 (fragment), in: NA, Cultuur

Thereafter, it was taken up with alacrity by producers throughout the island as a way of taking the export market by storm. By 1905, it was being produced at some thirty-two of Java's one hundred and seventy or more factories, much of it destined for consumers in the Indian subcontinent. By the mid-1920s, some 60 per cent of the colony's sugar factories were designated as white-sugar producers.[69] In the meantime, their techniques – and the quality of their output – improved markedly.[70]

A variety of factors were at play in facilitating manufacture on the island. Thanks to an advanced transportation infrastructure, which had grown apace in Java circa 1890 onward and which was quite without parallel elsewhere in the region, it was perfectly feasible – as well as desirable – to make large quantities of the commodity. The carbonation process central to its manufacture called for large quantities of limestone.[71] Where this was not available in the immediate locality, it could be delivered to the Java factories on the same heavy and light rail system that took away their finished product.[72] The coke that was used in the lime-burning process – each of the island's big white-sugar factories had its own plant for doing this – could likewise be delivered by rail from Java's major ports, much of it having been imported from Europe.[73]

Perhaps the most essential point about factory white was that it was cheap. Early in the twentieth century, it was authoritatively calculated that Java sugar could be processed into this form of the commodity for rather less than one-third of the cost of having it refined.[74] Moreover, the

Maatschappij Kadhipaten, 1858-1959, toegangsnummer 2.20.08, inv. nr. 60.

69 Calculated from statistics of *Suikerproduct der fabrieken* (1927), on the basis of those factories whose output was almost exclusively comprised of '*superieure hoofdsuiker*'. Earlier in the century, Martineau (1910:56-62) singled out Java as the country 'where carbonation has been adopted in many factories and [where] its use will probably increase with increased demand in Eastern markets for white sugar'. For an extended contemporary description of the carbonation process as carried out in early twentieth-century Java, see Prinsen Geerligs 1911:160.

70 Prinsen Geerligs 1904a:1339.

71 Martineau 1910:61. In Java, this limestone was available from a number of sources in the island itself. Prinsen Geerligs (1911:185) lists localities from Cirebon eastwards in which limestone was quarried.

72 See, for example, the Jaarverslag van de Chef der Exploitatie 1905, p. 4, in: NA, Semarang-Cheribon Stoomtram Maatschappij, 1893-1946, toegangsnummer 2.20.17, inv. nr. 8. It is remarked that along the sector of the north coast serviced by this line some six factories (Wonopringgo, Djatiwangi, Kadipaten, Tjomal, Sindanglaoet) have gone over to the manufacture of factory white, for which 'groote hoeveelheden kalksteen worden aangevoerd', in consequence of which the haulage of the same increased from 16,672 MT in 1904 to 28,357 MT in 1905.

73 Prinsen Geerligs 1911:185-6, 202. Prinsen Geerligs says that the alternative supply of coke was from Java's own small number of urban gasworks.

74 Prinsen Geerligs 1904a:1356. His calculation was that carbonation costs added about 30 cents to the manufacturing cost of each *picul* of sugar, whereas refinery costs were in the region of one guilder per *picul*.

bulk of the Java industry's potential new consumers were deemed to be more interested in price than in quality: 'de eischen, die in Azië de massa consument stelt, zijn niet hoog', as the industry's leading savant delicately expressed it. Both literally and figuratively the Java manufacturers were well positioned to exploit this evolving situation: they benefited from their proximity to the Asian 'mainland' where the (potential) market for factory white was to be found, while the industry's independence of metropolitan or other overseas refineries left it free, as were few of its major competitors, to take up the production of factory white on a grand scale. The great bulk of it, moreover, was destined for consumers in South Asia.

Prior to the 1890s, Java had virtually no direct sales there. By 1900, however, things had begun to change quite rapidly. Indeed, by the eve of the First World War, well over one-third of Java's exported output went to South Asian destinations, primarily Calcutta and Bombay, where its own factory white began first to challenge and ultimately totally to replace imports into the subcontinent from Central European producers (Imperial Germany and the Austro-Hungarian Empire). They, too, had sought to benefit from the much lower prices prevailing for industrially manufactured sugar after 1885 – essentially by dumping their heavily subsidized exports on the South Asian Market.[75] Their sales there peaked in 1906-1907 at something approaching 200,000 MT, when they amounted to around one-third of the subcontinent's total imports and, slightly exceeded in volume those from Java.[76]

Thereafter, however, factory white of European origin totally failed to match the growth in imports from Java. By 1913-1914, the latter had reached a pre-war peak of around 600,000 MT, or well over 70 per cent of total imports to the rapidly growing Indian market. Even so, a degree of rivalry continued and, more generally, the market for Java sugar

75 Competition on the Indian market between Java sugar and beet sugar from Imperial Germany and Austria-Hungary had begun in the 1890s. It was complicated by attempts by the British Raj to stem the tide of beet sugar into the subcontinent by way of countervailing duties circa 1900 – but the effect of such duties appears doubtful. See Prinsen Geerligs 1906:57-79, for an account of the convoluted history of these attempts. It appears that the German and Austrian producers were able to bear the cost of the new duties, and that imports continued on such a scale as to result in a threat (from London) to raise the duties to prohibitive levels. It would appear, however, that this threat was rescinded as a result of the general agreement about sugar subsidies enshrined in the Brussels Convention. According to Dutch sources, moreover, 'de Javasuiker ondervond in Britsch-Indië voortdurend scherpe concurrentie van de Oostenrijksche bietsuiker, die door de lage vrachten van de zwaar gesubsidieerde Oostenrijksche Lloyd werd gesteund' (Jaarverslag Factorij 1906, p. 16, in: NA, Nederlandsche Handel-Maatschappij (NHM), 1824-1964, toegangsnummer 2.20.01, inv. nr. 4555).

76 Prinsen Geerligs 1924:94.

remained strongly affected by reports about the weather in Europe and the projected size of the beet harvest down to the beginning of the First World War.[77] Nonetheless, any vestiges of a contest for market share in the subcontinent were ended quite decisively by the Great War. The beet sugar industries in war-torn Europe could not produce as before, and their chances of exporting were nil. Moreover, they took a long time to recover after the war was over – not least because the old Imperial German industry was now divided between the new German Republic and a revived Polish state. Worldwide, but above all in Central Europe, beet sugar production declined sharply: whereas in 1913-1914 it had amounted to some 9 million MT, five years later it had fallen to less than half that amount.[78]

THE JAPANESE MARKET, HONG KONG AND THE ZAIBATSU

Initially, as we have seen, Java's raw sugar found its prime Asian outlet in the refineries of Hong Kong. By the end of the century, however, the island's colonial sugar factories had also begun to supply newly established refineries in Japan, in a development that was destined to dominate the industry's late colonial history. Until the last quarter of the nineteenth century, Japan figured somewhere near the margins of the intra-Asian commodity trade in sugar. From the 1880s onward, this situation changed dramatically. There had been a notable growth in imports of primitively manufactured, pre-industrial sugar into Japan, circa 1870, initially from southern China, but subsequently from Formosa. Imported refined sugar, increasingly derived from industrially manufactured raw material from Java itself, started to penetrate this market during the 1880s.

Japanese imports of sugar, which had quadrupled in little over ten years, peaked around the end of the century, and were supplied primarily by the Hong Kong refineries and (largely as factory white) by the beet sugar industries of Imperial Germany and Austria-Hungary.[79] Predominantly, these imports were consumed by Japan's new urban

77 Jaarverslag Factorij 1911, pp. 22-3 and Jaarverslag Factorij 1912, p. 32, in: NA, NHM, 2.20.01, inv. nr. 4555.

78 Albert and Graves 1984:6.

79 See the trade statistics reproduced in Kraaij 1903:3. Total Japanese imports of sugar rose from 1,207,217 *picul* in 1889 to 4,928,075 *picul* in 1901. In the latter year, some 1,473,612 *picul* was supplied from Hong Kong, 1,192,828 *picul* from Germany and 560,850 *picul* from Austria-Hungary.

middle classes, a reflection of the fact that this type of sugar was significantly more expensive than the crude, non-refined sugar imported from either Formosa or the Philippines.[80] By 1897, Japanese per capita consumption of sugar had doubled, within less than a decade, to a little less than 5 kilo per capita, and continued to rise thereafter.[81] It comes as no surprise, therefore, to find that Japan was viewed as a highly important, and certainly potentially most lucrative, market in East Asia at the end of the nineteenth century. In the early 1890s, the Hong Kong refineries provided around 50 per cent of Japan's imports, and supplying the Japanese market had become the main business of both Swire's and Jardine's refineries. Unrefined sugar also came in from Formosa, and certain varieties of its raw, brown sugar (there was no industrial production in Formosa at this time) was much prized on the Japanese market.[82]

From the 1880s onward, moreover, Japan's burgeoning sugar consumption had come to attract the attention of the zaibatsu, the big industrial-financial-commercial conglomerates that were indelibly associated with Japan's late nineteenth-century advance in economic 'modernity'. As early as 1896, it was reported from Hong Kong that a Japanese syndicate 'has already sent its emissaries to Europe to study the best methods for plant etc'.[83] A couple of refineries were quickly established, one at Osaka and the other in Tokyo, with more to follow.[84] The Osaka refinery had German-built equipment and was said to be capable of producing 100 MT of refined sugar per day.[85] These refineries quickly came to be designated as 'a troublesome competitor' by their British counterparts in Hong Kong,[86] who previously had the East Asian market for refined sugar very largely to themselves. Indeed, plans were mooted (though

80 Sugiyama 1989. I am grateful to Kazuhisa Shimada for translating this paper.

81 Mazumdar 1998:375.

82 Mazumdar 1998:375; Van Lookeren Campagne 1897.

83 BSHK to Swire, 7-10-1896, in: JSSII 2/8.

84 According to *Japan* (1900), by 1899 there were two refineries in Japan: one at Osaka ('Japan Sugar refining Co.') and one at Tokyo ('Nippon Sei Seito Co.'). The same source also reported that 'a leading Japanese banker and merchant' was presently in the United Kingdom, inspecting machinery for purchase. See also Prinsen Geerligs 1904a:1323-5. According to this latter source (quoting contemporary Dutch consular reports), the refineries were, respectively 'The Sugar Refining Company' (Nippon Seito Kabushiki Kaisha); 'Tokyo Sugar Refining Company' (Nippon Seito Kabushiki Kaisha) and 'Dairi Sugar Refinery' (Suzuki Gomei Kaisha). By 1904 there was another refinery at Dairi near Moji – owned by 'one of the largest sugar merchants at Kobe' – which was going to take Java sugar via the new Java-China-Japan line that has 'regular 25 day sailings' (see *Consular report* 1904).

85 BSHK to Swire, 18-8-1896, in: JSSII 2/8.

86 BSHK to Swire, 25-3-1898, in: JSSII 2/8.

soon abandoned) to flood the Japanese market with cheap sugar in an effort to deter further investment in domestic refining.[87]

Mitsui and Mitsubishi capital – the capital, that is to say, of the two leading zaibatsu – was closely involved in the new ventures. Indeed, sugar was one of the most important items traded by Mitsui up to the outbreak of the Second World War.[88] During much of the 1910s and the first half of the 1920s, however, the biggest name in the country's sugar trade was not one of the established zaibatsu, but a (relative) newcomer – Suzuki Shoten. Founded in Kobe in 1874 specifically as a sugar-importing business, by 1914 Suzuki had become a widely diversified conglomerate, with major interests in steel and shipping. It eventually embraced some seventy-eight corporations and rivaled Mitsui itself in terms of paid-up capital and value of traded goods.[89] Nonetheless, sugar remained one of the key facets of its business. Indeed, an early twentieth-century head of the company apparently became known as Japan's 'king of sugar refining'.[90] By the beginning of the twentieth century, Japan had several major refineries – the newest one run by the burgeoning Suzuki conglomerate – geared quite specifically to the refining of sugar from Java. The foundations were being laid, in short, for what would rapidly become a Japanese 'sugar empire' – an empire whose existence was to have major ramifications for the entire Java sugar industry.

JAVA AND THE JAPANESE SUGAR EMPIRE

To envisage the web of Japanese sugar plantations, manufacture and commerce that came into existence during the opening decades of the twentieth century as Japan's 'sugar empire' is to underscore the comparison with its larger, virtually contemporaneous, American counterpart, whose Asian outliers were located in the Philippines and Hawaii, but whose heartlands were in the Caribbean. Both reflected the fact that, worldwide, a taste for white sugar and sugar-sweetened drinks – and, rather importantly in the case of Japan, alcohol manufactured from

87 BSHK to Swire, 18-2-1898, in: JSSII 2/8.

88 Sakamoto 1990:64, 87.

89 Suzuki's paid-up capital was 80% as large as that of Mitsui; at its business peak in 1917, its trade volume was 50% higher in value than the older company. For Suzuki, see Lynn and Rao 1995; Morikawa 1992:123-81.

90 Hirschmeier and Yui 1975:172.

sugar – was one of the consumerist hallmarks of capitalist industrial modernity.

In one key respect, however, Japan's sugar empire differed significantly from its American counterpart, which had a vastly greater domestic market in North America than its Japanese counterpart, and hence had no absolute need for export sales of its refined product. The Japanese refineries, on the other hand, were heavily dependent for their viability on their ability to divert 'excess' capacity onto overseas markets. Indeed, by the 1920s, Japan's refineries were supplying not only Japan's domestic market, but also that of the adjacent Chinese and Manchurian mainland immediately to the west and south. By the early 1930s, moreover, Japanese interests were operating three refineries in the new client state of Manchukuo, and by the end of the decade they were also running one in Japanese-occupied Shanghai.[91] As did their counterparts worldwide, by the late 1920s, Japanese sugar interests formed a cartel, designed both to restrain production and maintain the domestic price of the commodity.[92] Moreover, the fundamentally international character of the Japanese sugar empire – focused on the markets of its Asian neighbours, as well as on those of metropolitan Japan – was already firmly established in the pre-depression decade.

The empire drew its raw material from a variety of sources. Its eventual centerpiece was the island of Formosa (Taiwan), which Japan had acquired as a colony in 1895. Nonetheless, its suppliers were as far- flung as beet sugar producers in Korea (brought formally under Japanese control in 1910) and cane sugar factories in the mandated territory of the northern Marianas, in Micronesia, far to the south, which Japan gained in the wake of the German defeat in the First World War. By the mid-1930s, more than 11,000 hectares of cane and six or more large modern sugar factories existed there, worked by a mixture of Japanese, Korean and local labour.[93] The empire also established a beachhead on Java.

91 For the refineries in Manchukuo, see NHM Kobe to Amsterdam, 16-6-1932, in: NA, NHM, 2.20.01, inv. nr. 9230; for Shanghai, see Jaarverslag NIVAS 1938-1939, pp. 48-53, in: NA, NIVAS, 2.20.09.03, inv. nr. 13.

92 Sakamoto 1990:88. In 1929, Hong Kong sources claimed that an agreement had been reached among the Japanese sugar refineries, and that 'the Formosa, Meiji, Ensuiko, Nitaka, Hokkaido and Japan refineries are included in it […] it is reported to be very comprehensive, covering production of raws, selling of refined and finances' (BSHK to Swire, 18-1-1929, in: JSSIV 1/2).

93 For a succinct introduction to the Japanese sugar industry in the Marianas, see Ono and Lea 2001:5-9; Peattie 1988:123-32. For data on the number of factories, see H. Prinsen Geerligs and R. Prinsen Geerligs 1938:69: for the area under cane, see Weitzell 1946:201.

Around 1920, a handful of the island's factories (five out of a total of nearly 180) were owned by Japanese interests, including the Dai Nihon refinery company, one of Japan's biggest.[94]

The prime connection between the Java industry and the Japanese sugar empire, however, was essentially a commercial and financial one. Japanese interests had very little direct investment in the manufacture of Java sugar, but they had huge sums tied up in its purchase and shipment to Japan and elsewhere in East Asia. Developments here dated from around the turn of the twentieth century. Late in the 1890s, Mitsui established an office in Surabaya, Java's sugar capital, and thereafter the Japanese refineries began to take significant quantities of their raw material from the Dutch colony. Indeed, circa 1904, the new Suzuki refinery at Kobe appears to have drawn most of its supplies of raw sugar directly from Java via the newly established (and Dutch-run) Java-China-Japan Line's steamers.[95] In 1912, however, the Dutch company was joined on the East Asian route by the Japanese Nanyo Yusen KK Java-line,[96] and another Japanese shipping line entered the trade four years later.[97]

Japanese shipping was to become a very important facet of Java sugar's Asian connection. That connection was greatly accelerated, moreover, by the impact of the First World War and the consequent shifting of the Netherlands Indies out of the European and toward the Japanese and United States' economic orbits.[98] Though the end of hostilities in 1918 brought some return to pre-war conditions, the extent to which Japanese and associated commercial and financial interests had penetrated – and continued to penetrate – the Indies economy emerges quite clearly from an analysis of Java sugar sales in the course of the 1920s.[99] The successful articulation of this key dimension of the Asian connection, however, was contingent not only on Dutch colonial sugar manufacturers and Japanese sugar refining combines, but also on the central role of Java's Indies-Chinese business community.

94 See De Graeff 1945:266, as cited in Dick 1989:258; Post 1996:310-1.

95 *Consular report* 1904:406. For Java-Japan shipping connections from a Dutch perspective, see in particular Brugmans 1952:55-91.

96 Post 1995:155.

97 Dick 1989:245-8.

98 Tio Poo Tjiang 1923:59.

99 For overviews of the wider commercial context, see, for example, Dick 1989. Any historian venturing into the field of the Asian commercial networks linking colonial Indonesia to markets and capital in East Asia is heavily indebted to the ongoing research and extensive publications (and scholarly generosity) of the Dutch scholar Peter Post. In the context of the present discussion, see Post 1991, 1993, 1995, 2001.

By the early twentieth century, indeed, the dominant role in the export trade in sugar of the colony's European firms had come under challenge from Asian interests. The key enterprises were two burgeoning Indies-Chinese business concerns, OTHC and KHT (see above), based in Java but with operations extending from the Indian subcontinent to Japan. This ethnic identification of commercial firms in colonial Java would have been of questionable utility for much of the nineteenth century, in the sense that the Indies-European houses worked in fairly close concert with the businesses run by their Indies-Chinese counterparts. Indeed, given the extent of Chinese control of the 'up-country' trade in buying and selling of commodities of all kinds, it would have been impossible for them to have done anything else. By the late nineteenth century, however, and in the early twentieth, such juxtaposition makes a certain kind of sense. In the export of sugar, at least, the big 'European' and 'Chinese' firms appeared to see themselves as significant rivals.

DUTCH SELLERS AND JAPANESE BUYERS: THE VJSP AND ITS CUSTOMERS[100]

Throughout the 1920s, the great bulk of Java's sugar sales, representing about 90 per cent of the colony's total export production, were carried out through the Vereenigde Javasuiker Producenten (VJSP, United Java Sugar Producers Association), a cartel of manufacturers established in 1918.[101] On the basis of the VJSP's extensive surviving data, it can be shown that, on average, in the ten-year period prior to the sudden termination of large Japanese purchases of Java sugar in 1928, around one-third of the cartel's sales were made direct to Japanese buyers, particularly Suzuki and Mitsui.[102] During these years, on average Japanese purchases of Java sugar fell only a little short of those made by the colony's long-established European 'sugar' firms, principally Fraser

[100] For this section of the chapter, I have drawn heavily on the analysis provided by Post 1991, 1993.

[101] The VJSP cartel embraced 160 of a total of 186 Java factories operating circa 1919, and purchases made through its agency under-represent total Java sales by around 10%. On the VJSP, see Taselaar 1998:107; Tio Poo Tjiang 1923:50.

[102] Together, the sugar purchased by Suzuki and Mitsui amounted in 1921 to 258,485 MT, worth 61,791,301 guilders, or more than 16% of the total value of sugar sold by VJSP in 1921. The relevant data are to be found in the Annual Reports (Jaarverslagen) of the VJSP for the years 1918-1932, in: NA, Vereniging Verenigde Java-Suiker Producenten (VJSP), 1918-1938, toegangsnummer 2.20.09.02, inv. nrs. 5-18.

Eaton (part of the Maclaine Watson group), Erdmann & Sielcken, and Wellenstein Krause.[103] Indeed, in some few years – 1922-1923 and 1926-1927 – Japanese firms bought substantially more sugar than their colonial-based European counterparts.

Yet, the importance of Japan to the Java sugar industry was not simply that it bought large quantities of sugar. Japanese interests were also prominent in the financing of the sugar trade over and above the direct purchase of the commodity.[104] In 1921, for example, just over half of the sugar sold by the VJSP, to the value of nearly 178,600,000 guilders, was disposed of against guarantees (that is, under arrangements '*waarvoor zekerheid moest worden verlangd*') provided by banks and other financial institutions. In all, ten such businesses were involved, but six of them led the field by a wide margin.

Ranked in order of importance – measured in terms of guilder value of their investment – the foremost of these six key financiers was the Indies' own premier financial provider, the Batavia-based De Javasche Bank (DJB), closely followed by the Bank voor Indië, established in Rotterdam only a year earlier.[105] Next, however, were two Japanese businesses. One was the Taiwan Ginko (Bank of Taiwan, BOT), the quasi-official, central bank of the Japanese colony. Founded at the very end of the nineteenth century to facilitate the penetration of Japanese capital into mainland China and Southeast Asia, by the early twentieth century it had several branches in the Netherlands Indies. The other was the Yokohama Specie Bank, the institution that in the early twentieth century financed the bulk of Japan's foreign trade.[106] The remaining European member of the 'big six', the Batavia Branch Office (the *Factorij*) of the Amsterdam-based NHM, the biggest investment and banking concern operating in the Indies, ranked at number five, only slightly

[103] Something of the history of these firms can be gleaned from their respective 'commemorative volumes': *Wellenstein* 1932; Schmiedell 1924; *First hundred years* 1927.

[104] The data on which this and the following paragraph are based come from Jaarverslag VJSP 1921, p. 27, in:
NA, VJSP, 2.20.09.02, inv. nr. 7, and from Jaarverslag VJSP 1925: [nota] 'Aan de Commissie van Vertegenwoordigers der VJSP', 27-2-1925, in: NA, VJSP, 2.20.09.02, inv. nr. 11. The notable absentee from the ranks of guarantors in 1925-1926 (given the earlier collapse of the Bank voor Indië) was DJB.

[105] On DJB, see Claver 2006. On the Bank voor Indië, see Taselaar 1998:57. The Bank had been set up in 1920 by the Rotterdamsche Bankvereeniging (Robaver) and was liquidated with the collapse of the Robaver in 1924 – victim of a more general banking crisis in the Netherlands in the first half of the 1920s.

[106] On the Bank of Taiwan and, more generally, the role of Formosa in the development of Japanese financial and commercial ties with Southeast Asia, see Schneider 1998:170-2.

ahead of Mitsui Bussan Kaisha, the commercial and banking wing of the eponymous combine. Through the investments of these several firms, Japanese or Japanese-colonial capital provided in 1921 around 46 per cent of the financial backing for that part of the VJSP's sugar trade that was carried out on the basis of bank guarantees; by 1925, the only other year in the twenties for which this information is available, it provided some 50 per cent.

THE ROLE OF THE BIG INDIES-CHINESE MERCANTILE HOUSES

In assessing the full extent of Japan's position in the trade in Java sugar, the large sugar purchases of Java's Indies-Chinese firms also have to be taken into account.[107] Along with the Japanese and colonial European firms engaged in the trade in Java sugar in the 1920s, Indies-Chinese business concerns also played a significant role, presaging their larger and later role as Asian 'multinationals'. From the point of view of the present analysis, however, the immediate point is the extent to which, in the 1920s and earlier, they drew on Japanese capital to underpin their ventures in the Java sugar business. In total, Indonesian-Chinese purchasers of Java sugar accounted for a little less than one-third of all the sugar sold by the VJSP in 1921, and many small dealers were involved, most of whom appear to have been engaged in the speculative re-sale of sugar in Java itself. Though there were a plethora of such firms, only two stood out as consistent and large-scale participants.

It was KHT and Kian Gwan (see above), however, which bought the bulk of the sugar sold by the VJSP to Indies-Chinese buyers. Both firms had long-term links with Japanese capital. Kwik Djoen Eng, who master-

[107] Already circa 1900 it was reported that most Java sugar was imported into China (as distinct from Hong Kong) by two Hong Kong-based Chinese firms with branches in Java at Surabaya and Semarang respectively, and that the two firms worked closely together. See Corsten (1900:339), who identifies the firms as Kwong Sing Chang and Kwong Hop. The firms' offices were, respectively, in Hillier St and Bonham St, Hong Kong. It is not clear from this source who their Java connections were, but Kian and Gwan and Ho Bin seem the most likely candidates. For confirmation that in Hong Kong, 'Chineese importeurs sedert vele jaren in relatie met Chineezen in Semarang en Soerabaia zijn', see also Jaarverslag NHM Agentschap Shanghai 1906, pp. 3-4, in: NA, NHM, 2.20.01, inv. nr. 5168. They were said to ship Java sugar to 'Chinese ports' and to Japan, and also to sell to the refineries there. At this date, there was almost no Java sugar imported directly to Shanghai, the gateway not only to the Yangtze valley but also to the whole of north China. When direct trade did begin a few years later, it was again quickly dominated by 'Chinese' firms with strong Java connections.

minded KHT from the 1910s until its collapse in the 1930s, had major interests on Formosa, where he owned a tea-export company – and had close links with the Bank of Taiwan that dated back to the period of its foundation in the early years of the century. Indeed, it was in what was then Formosa that he died in 1935. Kian Gwan's commercial profile showed some similar traits. Early in the twentieth century, the firm had opened a branch in Kobe, in addition to those in Hong Kong and Shanghai. Oei Tiong Ham, the head of the conglomerate of which Kian Gwan was a part, had close contacts with Japanese capital. He worked hard to promote collaboration between Chinese and Japanese traders and to mitigate the impact in the Netherlands Indies of anti-Japanese commercial boycotts. Close and early ties to the Bank of Taiwan were also part of his business profile, and like Kwik Djoen Eng, he had a Japanese passport (and hence dual citizenship in the Netherlands Indies), in consideration of his standing in East Asia in general and Formosa in particular.

The extent to which KHT's and Kian Gwan's operations were financed by Japanese capital is difficult to say, and other sources were also involved. It rather looks, for example, as if DJB was the major creditor of KHT.[108] Nonetheless, this hardly detracts from the conclusion that for the better part of a decade, prior to 1927, Japanese capital, either directly or indirectly, through Japanese businesses and banks and through their links with the colony's Indies-Chinese 'multinationals', accounted for the greater part of Java's export trade in sugar.

JAVA SUGAR'S ASIAN BEDROCK

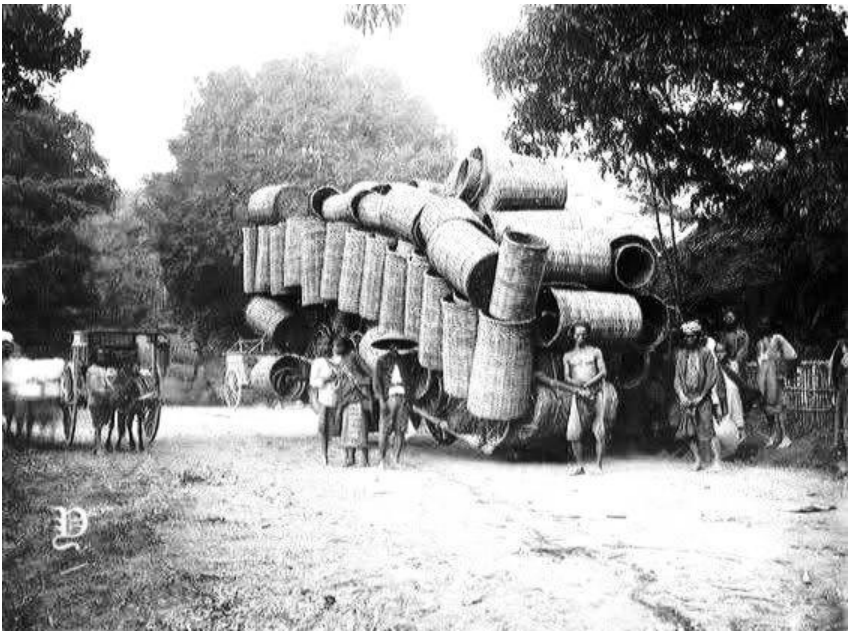
Between 1907 and 1914 the recorded output of sugar produced worldwide increased by more than one-third. As far as the international sugar economy was concerned, the age of mass production had indeed arrived. Java had advanced into the new era as the prime supplier of industrially manufactured, 'centrifugal' sugar to expanding Asian markets, and by the eve of the First World War, Java's sales elsewhere in Asia had become the bedrock of the industry. The context, however, was one in which (in 1908) the revived Cuba industry had overtaken the Dutch

[108] Post 2002; Claver 2006:291.

colony in terms of gross output, and resumed the position of the world's largest single producer of cane sugar from which it had been temporarily dislodged by war and revolution during the previous decade. Java, meanwhile (1907-1914), was ousted from its markets in 'the West', so that – albeit exceptionally – it could be remarked that in 1913 'not a sack' of its output penetrated 'west of Suez'.[109] Despite an interlude during the War itself, when large quantities of Java sugar went to the United Kingdom to make up for the deficit in its supplies of the commodity consequent on the severing of commercial ties with Imperial Germany (its biggest supplier in 1914), this continued to be the case through until the early 1930s. Around 1890, despite significant increases in recent years, only 25 per cent of Java's sugar exports went to Asian destinations. By 1900 some 38 per cent of its output was sold in Asia, and a decade later this figure had risen to more than 72 per cent, the main customers being British India (38.5% of total exports), Hong Kong (17.6%) and Japan (10.5%).[110] The trend continued into the 1920s, by which time 85 per cent or more of Java's sugar – both in its raw state and as factory white – to Asian markets. Prior to 1914, Java's position in Asian markets had been under challenge from the beet sugar producers of Central Europe. This challenge collapsed, however, once the war had broken out, and was not resumed thereafter.

The upshot was that, until late in the 1920s, Java sugar enjoyed an unprecedented degree of hegemony in both South and East Asia – and at various points in between. Then, rather suddenly, the bedrock on which the industry's Asian connection stood was rent asunder, most immediately and quite literally by an earthquake. The subsequent collapse of the Asian connection, and its ramifications for the history of sugar production in late colonial and postcolonial Java, will be discussed later in the book. What we will now turn to is how the Java sugar factories of the late nineteenth and early twentieth centuries succeeded in ramping up production to meet the requirements of newly opened markets elsewhere in Asia – and the difficulties that they encountered in doing so.

[109] Helfferich 1916-17:170-1.
[110] Prinsen Geerligs 1912:140-1.



Chapter 2

A precocious appetite

Fertilizer, horticulture and agro-industry in the field

A few years before the outbreak of the First World War, the newly established International Institute for Agriculture in Rome (the precursor of the present-day Food and Agriculture Organization of the United Nations) began collecting data on the production and use worldwide of chemical fertilizers. Its findings still have the power to astonish. They reveal that 'little' Java, with an area of no more than 125,500 square kilometres, considerable tracts of which are volcanic slopes inhospitable to most forms of agriculture, was nonetheless the seventh in rank among international consumers of sulphate of ammonia.[1] The great bulk of this nitrogenous fertilizer was consumed in the West, where its main producers were almost exclusively located. In this context, Java's consumption of some 68,000 MT, or around one-twentieth of the world's total, was phenomenal in global terms. Indeed, outside the West only Japan (115,000 MT) had a higher recorded consumption than Java.[2] In Java, unlike Japan (where it appears to have been expended on a variety of agricultural pursuits), such consumption had everything to do with sugar and the island's role as one of the world's greatest producers of the industrially manufactured form of that commodity. It reflected the development in Java sugar of an agro-industry in the field of a unique and remarkable kind. Inter alia, it was characterized by a quite extraordinary degree of attention given to the agriculture of cane, manifested in

[1] On the international production of, and trade in, sulphate of ammonia between 1907 and 1916, see *Statistique agricole* 1917:790-1, 822-3. For a contemporary discussion of this evidence and its relation to Java, see Milo 1911; *Wereldproductie kunstmeststoffen* 1913; Van de Leemkolk 1915.

[2] Total recorded world consumption in 1913 amounted to 1,286,757 MT. Germany accounted for nearly 36% (460,000), the United States for nearly 21% (266,850) and France for 7.5% (97,000). Elsewhere in the 'Third World', Egypt accounted for a very modest 1,650 MT and the Indian Ocean island of Mauritius was importing 5,000 MT annually by 1913 (Van de Leemkolk 1915:111; *Statistique agricole* 1917:829).

hugely labour-consuming industrial work methods and a programme of Research and Development that was the acknowledged world leader in the field. First and foremost, however, for more than two decades at the end of the nineteenth and the beginning of the twentieth centuries, Java sugar forged ahead on the basis of a fertilizer revolution unparalleled elsewhere in the international sugar economy.

The island industry's precocious appetite for chemicals both underscores and complicates the existing narrative of its late colonial history. That narrative insists, quite correctly, on the primacy of developments in the agricultural sector of production. In explaining how Java came to occupy a key position in the international sugar economy, however, it has largely neglected what I shall term a 'fertilizer revolution'. Yet, this revolution – given its dramatic impact on productivity, the term seems appropriate – vitally underpinned the industry's expansion during two crucial decades at the end of the nineteenth and the beginning of the twentieth centuries. In the historically specific circumstance in which the Java industry had to operate, hemmed in by the hunger for land of an ever-increasing peasantry, fertilizer became a land substitute. It enabled the industry to circumvent at least some of the obstacles to the expansion of production by making an ostensibly finite amount of land ultra-productive. Sugar was far from self-sustaining in the agricultural sense. Instead, soil planted to cane was enriched by a lavish application, first of local, organic manures, and later (though never exclusively) of imported chemical fertilizer. The costs involved – including the labour involved in its application – were enormous and often amounted to as much as one-quarter of total expenditure in the industry's agricultural sector.

THE SCALE OF OPERATIONS AND ECONOMIES OF SCALE

By the early twentieth century, the two island-producers, Java and Cuba, shared a position at the apex of the international sugar economy as the world's two largest exporters of cane sugar. However, the differences between the two – and between Java and most other major sectors of the international sugar economy – were considerable. This was reflected most obviously in the contrast in scale: Java's units of production (or, at least, the great majority of them) were and remained small in comparison to those of its Caribbean counterpart. They were, on average, less

than half the size – measured in terms of annual output per unit – of those of Cuba (though roughly on a par with those in the much smaller industries of the Philippines, Taiwan and Hawaii).[3] Comparisons between Java and other industries in the Asia-Pacific region hardly mattered: they supplied almost exclusively protected metropolitan markets and in no way rivalled the Dutch colony. Comparisons with Cuba, on the other hand, mattered a great deal: both islands were heavily reliant on international sales, Java virtually exclusively so, and although Cuba was advantaged by a favourable tariff in the United States, its sugar factories still saw themselves as competing with Java on a 'world' market.

Of course, part of the explanation for the differences in the sheer size of their operations lay in differences in the agricultural-agrarian setting. Unlike Cuba, in Java there was simply not enough land available, on so densely populated an island, for the creation of massive units of production. Even so, it is possible to make too much of this point. Along with the enhancement of soil fertility, and the securing thereby of greatly increased per hectare yields, went a determination by Java's sugar companies to engross ever more land.[4]

Against a variety of odds, and assisted not a little by vast irrigation and drainage schemes inaugurated by the Indies government late in the nineteenth century with a view to alleviating Java's deficit of arable land, between 1880 and 1930 the sugar industry was able to achieve something approaching a six-fold increase in the area covered by their operations. Overall, the total amount of land brought annually under cane in Java rose from 34,500 hectares in 1880 to 147,500 hectares in 1914.[5] By the end of the 1920s, at the height of the industry's expansion, it was nearly 200,000 hectares.

MODERATE-SIZED FACTORIES AND THE ABSENCE OF CENTRALES

During the closing years of the nineteenth century, Java's long-established network of industrialized sugar factories continued to build on

3 See Table 2.1 in Bosma, Giusti-Cordero and Knight 2007:26.

4 For the broad statistical picture relating to the increase in cane yields circa 1880-1930 and the expansion of the area under cane, see Appendix 1.

5 Creutzberg 1975:74-5.

the technological advances achieved in earlier decades. Most immediately, this involved the completion of that changeover to multiple-effect apparatus – the key to the process of continuous operation associated worldwide with the age of mass production – that had already been well advanced in Java prior to the crisis of 1884.[6] Thereafter came major developments in the multiple milling of cane and the (initially piecemeal) electrification of the factory's operations.

Nonetheless, Java's units of production (with a few spectacular exceptions) remained modest in comparison to their Cuba counterparts. Several factors were involved. One was a degree of institutional inertia consequent on a long history of uninterrupted operation that combined (as we shall see in a subsequent chapter) with a relative shortage of finance to limit the size of Java industry's operational units. Prior to the interwar depression, attempts in Java to consolidate existing enterprises into larger, more economically rational units met with very limited success. Some leading people in the industry did indeed 'think big', but many – though not all – of their ambitions were frustrated. In the sugar belt of the north coast of Central Java in the 1890s, for example, one particularly energetic factory *administrateur* – the general manager of the entire enterprise – devised a scheme for the amalgamation of three adjacent factories. It remained a pipe dream, nonetheless. His factory belonged to a family concern and the two others belonged to different small combines. None of them had the resources – and perhaps the will – to buy out the others.[7]

Size, moreover, was only one of the key differences between Java and other leading sectors of the international sugar economy, Cuba included. Worldwide, by the early twentieth century, the once typical unit of production that combined factory and plantation had been largely

6 See, for example, the technological progress (mostly installation of 'multiple effect') made in the major 'sugar belt' along the north coast of Central Java prior to 1884, as listed in *Koloniaal verslag* 1875-1882; this listing stops in 1882 and in any event is demonstrably incomplete prior to that date. Additionally, see Jaarverslag Nederlandsch-Indische Handelsbank 1882, p. 10, in: NA, Nederlandsch-Indische Handelsbank/Nationale Handelsbank, nummer toegang 2.20.68, inv. nr. 263; Jaarverslag NHM Factorij Batavia 1882 [57], p. 49; 1883 [58], pp. 51-2, in: NA, NHM, 2.20.01, inv. nr. 4552; 'Overzicht van de installatie van Wonopringgo', circa 1905, in: NA, NHM, 2.20.01, inv. nr. 7999, file 593 Wonopringgo; Deerr 1949-50, II:571.

7 See [S.C. Musschenbroek], 'Schema tot een combinatie der ondernemingen Tjomal, Bandjardawa en Sragie tot een naamlooze vennootschap', 20-7-1894, in: NA, NV Maatschappij tot Exploitatie van de Suikeronderneming Tjomal, 1872-1971, toegangsnummer 2.20.39, inv. nr. 60. One of the great advantages mentioned was that 'men zal in de geheele streek een veel grotere macht gaan uitoefenen, en zoo noodig met meer success de loonstandard kunnen verlagen tot het laagste mogelijk peil, waarvoor de bevolking zou kunnen en willen werken'.

or entirely superseded by a network of *centrales*. These large, centralized sugar factories drew their raw material from a multiplicity of sources, rather than simply from their own plantations (if, indeed, they even had any). As such, they were widely seen as an economically rational response to the escalating costs of the high-tech manufacturing equipment that had become *de rigueur* for any sugar industry with a claim to international significance.[8] There were some exceptions, notably the relatively small industries of Hawaii and Peru, where direct factory control of fairly intensive cane agriculture had important parallels with Java. Elsewhere, however, as has been remarked of Cuba, 'the new technology promoted a consolidation of mills into much larger units of production, but, simultaneously, a disintegration of the [self-contained] sugar estate'.[9]

In Java, by way of contrast, the factory-cum-plantation, as established in Java during the middle decades of the nineteenth century, continued to dominate the industry. (The vital difference – and one to which we shall return shortly – was that from the 1880s onward the factory now directly managed the cultivation of its raw material.) Something resembling the *centrales* was not entirely absent in Java. In some parts of the colony, indeed, a number of rudimentary satellite-*centrales* complexes existed, usually as part of a family network of ownership. Moreover, at certain periods, and in a limited number of places, peasant out-growers provided colonial factories with some of their raw material. Both were exceptions. One consequence was that the cost-savings inherent in the introduction of the *centrales* were largely denied to the industry: Java could only reproduce to a rather limited extent the economies of scale that were notionally one of the most critical single features of the age of mass production. In terms of investment in the manufacturing sector, where the basic factory installation, whether large or small, had to incorporate much the same machinery (albeit on a varying scale), this made Java a relatively high-cost industry.

This might, of course, have been a critically disabling factor in the industry's bid for expansion. In fact, however, the Java producers were able to enter the age of mass production on internationally competitive terms that compensated for the (relative) absence of economies of scale in manufacturing. They did so by paying an internationally unparal-

8 For a brief discussion of the emergence of the *centrales*, see, for example, Bosma, Giusti-Cordero and Knight 2007:15-7.

9 Dye 1998:41.

leled degree of attention to the agricultural sector, something which was greatly facilitated by the 'direct farming' of cane associated with the very persistence in the industry of factory-and-plantation units of production. Sugar manufacturing in late nineteenth- and early twentieth-century Java was not without its high-tech dimensions and, broadly speaking, the industry was no laggard in importing the latest in sugar processing machinery. Long-established factories were extensively renovated and a plethora of new, state-of-the art installations joined the existing network of manufacture. Nonetheless, at the heart of the industry's success was its evolution into an enterprise founded at the most fundamental level on field productivity totally unmatched worldwide. There was an old saying in the industry that 'sugar is made in the field rather than the factory' – and nowhere was this more true than in late colonial Java.

THE DIRECT FARMING OF CANE AND THE FOUNDATION OF AN AGRO-INDUSTRY

The key to developments in the cane field was the direct farming of cane. In essence, this was a set of arrangements whereby the sugar factories themselves took charge of even the smallest detail of how their raw material was cultivated, and did so through close supervision carried out by their own employees. Direct farming had not been typical of the foundational stages of the industry's history in the middle decades of the nineteenth century. Previously – during the era of the *Cultuurstelsel* – the 'plantation' had consisted of assemblages of fields where peasant cultivators grew cane under the supervision of village headmen and state officials. Notionally, at least, the factory had no involvement until the cane was ripe and ready to be harvested. Famously, the *Cultuurstelsel* had been based on an organizational dichotomy that left local-level state officials, working in tandem with village headmen, in charge of the agricultural sector. Though some mid-century manufacturers did indeed contrive to influence what went on in the cane field, well in advance of the campaign itself, the formal arrangement prevailing under the *Cultuurstelsel* created what many came to argue was a disabling divide between factory and plantation.

Late in the nineteenth century, however, all this changed, and direct farming became the order of the day. Developments associated with the

gradual dismantlement of the *Cultuurstelsel* in the 1870s and 1880s created a basis for a system under which factory and field became a tightly integrated unit of manufacture. The very fact that the late nineteenth-century Java industry did not – or could not – switch to the *centrales* model enabled the island's sugar companies to exploit possibilities that were hardly or rarely open to more decentralized systems of providing manufacturers with their raw material. The importance of this development for the Java industry's trajectory in the age of mass production can hardly be overstressed. The fact was that the new way of organizing the production of cane – centralized and under the direct management by factory personnel – opened up possibilities for the improvement of cane farming that had not (at least, not formally) been available to the industry prior to the 1880s.

Under the new, post-*Stelsel* dispensation, cane continued, as of old, to be grown (for the most part) on peasant land, and the existing system of two-, three- or even four-year rotations between sugar cane, rice and other peasant crops – the system known in Dutch as *wisselbouw* – remained in force. From the industry's standpoint, however, the important point was that the factories were now allowed to rent fields from village landholders on a periodic basis. By the same token, they also took over responsibility for managing cultivation, using casually hired wage labour. This, at least, was the basis of the arrangements hammered out in the wake of the *Cultuurstelsel* in the directly ruled, so-called 'government lands' along Java's north coast and in the eastern parts of the island. Around 1900, about four-fifths of the industry's operations were located there.[10]

A different system of exploiting both land and labour prevailed in the indirectly ruled territories – the Vorstenlanden – of Yogyakarta and Surakarta in Central Java. In those parts of the island the colonial sugar companies were able to lease 'rights' over land and labour from the aristocratic *appanage* holders at the princely courts. Prior to reforms inaugurated in around 1918, and very slowly implemented thereafter, this gave the industry a degree of control over 'peasant' resources notionally far greater than anything it enjoyed elsewhere in the colony.[11] In terms of the industry's operations in Java as a whole, the Vorstenlanden system

[10] Creutzberg 1975:74.

[11] The classic account is in Selosoemardjan 1962:258. For a rather more nuanced (and richly documented) version of the relations of production prevailing on the European-held 'estates' in the Vorstenlanden, see Margana 2007.

was scarcely an insignificant exception: nonetheless, the differences were perhaps not quite so great as might appear. *Wisselbouw* prevailed there much as it did in the government lands, and although the economic relations between the sugar companies and their surrounding villages were differently articulated from elsewhere in the colony, the broad nexus between industry and peasantry – and the sugar complex's enmeshment within a much larger 'peasant' economy – was substantially the same as in the government lands. So, too, was the prevalence of the direct farming of cane by the factories concerned.

DIRECT FARMING AND THE PEASANTRY

Direct farming brought the sugar companies and their local managers into contact with the landholding peasantry as never before. There evolved in the countryside a web of often nefarious practices for ensuring that the factories obtained the land they needed. From the end of the 1890s, government regulation determined precisely how much land any given factory could acquire for cane at any given time, and set a minimal rental for the land that was acquired in this way. Beyond that, the sugar companies played fast and loose to get access to land for rental and to the irrigation water during the dry season on which the success of cane agriculture depended. It was also the industry's good fortune – a stroke of luck, so it would seem – that in the late 1880s and 1890s the 'stubbornly low price of rice',[12] as one leading historian has referred to it, acted to

[12] Elson 1984:140. Creutzberg (1978:44) shows (July) rice prices at Batavia ranged between about 10.6 to 13.5 guilders per quintal in the period 1872-1882 (inclusive), whereas between 1883 and 1910 they ranged as low as 6.3 guilders, and on only four occasions (marginally) exceeded 10 guilders per quintal. In terms of what was going on in rural Java in the 1880s and 1890s, however, explanations of this kind are not quite as straightforward as they might seem. In particular, the price of rice remains a contentious issue. The most immediate objection is that the 'price' of rice as we know it for the closing decades of the nineteenth century is seriously defective, in so far as it is based on the bulk purchase of rice in quantities – and qualities – which differed greatly from those in which it was normally traded in Java's often still isolated localities. Rice was so various a crop, moreover, that, in late nineteenth-century conditions at least, it should not be given a homogenized price: there were just too many different varieties and markets. Furthermore, it can be argued that the amount of Java's vast rice production that was actually traded, at least for cash, was so miniscule as to invalidate assumptions about economic conditions predicated on the 'price' of rice. This is essentially Creutzberg's point (1978:19) when he remarks that, 'Compared with total home production, imports of rice covered only a small part of total consumption. The influence of foreign rice on the market in Indonesia can therefore rightly be questioned.' At the same time, however, it also can be argued that just *because* the amount of traded rice was so small relative to Java's total production, its price *was* susceptible to the impact of 'cheap' rice from overseas. Given these problems, it

hold down, or to drive down, the cost of rentals to levels that matched the industry's need to produce a far cheaper product than had been the case in the halcyon days before the crisis of 1884.

The Wonopringgo sugar factory in the Pekalongan Residency on the north coast of Central Java is a case in point. Wonopringgo was a medium to large factory, well equipped, and owned and managed by the NHM, still the colony's largest Western enterprise at the end of the nineteenth century and possessed of considerable holdings in sugar. Reasonably detailed breakdowns of the costs of production exist for Wonopringgo from the mid-1880s onward.[13] They show that for much of the 1880s and 1890s, the factory's gross production costs per hectare of plantation remained fairly constant, except for a significant dip in the late 1890s that was subsequently 'rectified' early in the new century. What did not remain at all constant, however, was the output of sugarcane per hectare. Leaving aside one or two 'poor' years (almost certainly accounted for by climatic factors), plantation yields appear almost to have doubled in the twenty-five years between 1880 and 1905. Given some difficulty with the data for the beginning of that period, this calculation may be on the high side. Nonetheless, the considerable increase that undoubtedly took place was all the more remarkable because it occurred at a time when the factory was expanding its operation into areas that would not earlier have been judged as best suited to cane.

Since these greatly improved plantation yields were adequately reflected in Wonopringgo's output of sugar, they provide the key explanation of why, despite the much reduced world price of the commodity, Wonopringgo remained (except in some very few years) a profitable venture for the NHM. In attempting to explain this substantially increased productivity in the field, two explanations stand out. The first – already well rehearsed earlier in this chapter – relates to the significantly increased use of (chemical) fertiliser. The second relates to the ready availability of labour at a cost low enough to make its employment feasible. The two are complimentary and, indeed, closely associated. Low wages were the sine qua non of a fertiliser programme predicated on massive amounts of manual labour. The per hectare cost of labour as a percent-

might be wise to eschew any too enthusiastic a connection between the low 'price' of rice and the sugar industry's capacity for subordinating Java's rural resources. At the same time, however, some connection seems inescapable. The argument is about how much explanatory weight it will bear.

13 NA, NHM, 2.20.01, inv. nrs 7945, 7999 dossier 593.

age of total costs in the plantation sector of production at Wonopringgo in the 1880s and 1890s did not in itself fall substantially. What can safely be assumed, however, is that far more workers were employed at the prevailing low wages and that this in turn meant that labour-intensive techniques could be employed – above all in the application of fertiliser to the growing cane, but also in weeding and the like – and that these techniques secured far more cane (and sugar) for the same outlay.

The industry also managed to cut its manufacturing costs. As elsewhere in the international sugar economy, as it entered the age of mass production late in the nineteenth and early in the twentieth century, the Java industry was able to achieve a marked reduction in manufacturing costs per unit of production. Lower wages were one factor here, but so, too, were dramatically reduced fuel bills consequent on the installation of multiple-effect apparatus in the boiling house. Advances of this kind in the manufacturing sector, already well underway before the crisis of 1884 began, paid rich dividends thereafter. At Wonopringgo, for example, between 1889 and 1905 the unit costs (per quintal) in the

Wonopringgo: A key sugar factory on the north coast of Central Java owned by the NHM, the largest of the Dutch business concerns operating in late-colonial Indonesia, around 1915 (KITLV 18218)

manufacturing sector fell by just under 25 per cent. Nonetheless, cost-reductions in the agricultural sector were much more significant. At this same factory, over this same period, unit costs (per hectare) in the cane field fell by over one-third, in tandem with an increase in cane yields of nearly 43 per cent.

THE BIRTH OF AN AGRO-INDUSTRY

From the 1880s onward Java sugar participated, well ahead of most of its international counterparts, in a wave of agricultural innovation that transformed agriculture into a manufacturing industry in its own right. Commercially manufactured inputs, principally of chemical fertilizer and feedstuffs, came to play an essential role in securing what became in consequence a manufactured (rather than simply extractive) output. Although usually dated in Western Europe and North America from the mid-nineteenth century, it also had a global reach.[14] It was central to developments in Java sugar.

Industrially manufactured, chemical fertilizers began to be a significant force in agriculture in Western Europe and the United States from around the mid-nineteenth century onward. Initially, many of them were of dubious quality and of doubtful efficacy. From the 1870s onward, however, and in tandem with falls in international freight rates, consistent, reputable chemical fertilizers with a predominantly phosphate or nitrogen base began to be developed by major producers in the West.[15] These producers had an eye on both their own and specifically colonial markets. Characteristically, a pamphlet of the 1890s advertising Cross's Celebrated Fertilisers – the firm's Port Dundas works in Glasgow was claimed to be 'among the most extensive in the world' – made specific reference to their products for 'Sugar-cane, Tobacco, Coffee etc' and their widespread 'Agencies in the Colonies'.[16]

The Java sugar industry's fertilizer of choice, sulphate of ammonia – *zwavelzure ammoniak*, or ZA, to use its standard Dutch acronym – was a rather special case. Originally a by-product of the gas works and coke-

[14] Thompson 1968, 1996, 2000.

[15] Wines 1985:142-6; Miller and Greenhill 2006:228-42.

[16] See enclosure in [the Rotterdam firm] A.J. van Breen [Cross's exclusive agents in Holland] to the NHM 30-4-1891, 'Diversen over bemesting', in: NA, NHM, 2.20.01, inv. nr. 7964.

ovens of the industrialized world, sulphate of ammonia subsequently began to be directly manufactured, eventually on a massive scale, by industrial methods. Based on the Haber-Bosch process developed early in the twentieth century, such methods were first applied commercially in Imperial Germany on the eve of the First World War.[17] Well before that, however, sulphate of ammonia had already been widely adopted by the sugar beet farmers of Imperial Germany.[18] There was a direct link here to the cane fields of Java. The agricultural experts who were employed in the Java sugar industry from the 1880s onward (see below) were themselves fully conversant with the German beet industry: indeed, many of them had received their training there.

To begin with, however, the fertilizer revolution in Java owed relatively little to chemical, industrially manufactured and imported fertilizers in any shape or form. Instead, it got underway with organic, locally available fertilizer in the form of what the Javanese called *bungkil*, or oil cake, generally comprised of the residue of *kacang* (ground nuts) that had been crushed for their oil.[19] *Bungkil* was manure with which Java's cane growers had been familiar since at least the mid-eighteenth century.[20] The history of *bungkil*'s use in the industry is an important one, in so far as it undermines any residual notion of a simple diffusion from the West in respect to the nexus between field science and colonialism.[21] To an extent that reflects a gathering critique of diffusion, the antecedents of the fertilizer revolution were to be found in long-standing practices in Java itself, as well as in exogenous science: the case of Java sugar underlines both the value of expatriate European expertise and the importance of indigenous, local foundations on which it could build, and within whose parameters it could hope to flourish. To adopt Stuart McCook's evocative phrase, it was 'a Creole science', whose ambiguous location transcended sharp distinctions between colony and metropolis.[22]

17 Smil 2001:48-50.

18 Thompson 2000:1035; Perkins 1981.

19 See *Boengkil* 1917. *Boengkil* (1917) specifically mentions *kacang bungkil*, *kaliki bungkil* and *kapokpitten bungkil*, the first of which has the highest nitrogen content.

20 The late nineteenth-century Indies' agricultural expert K.W. van Gorkom (1879) cited late eighteenth-century sources on the considerable quantities of animal manure and *kacang koeken* then used on sugar cane in the Batavia Ommelanden.

21 For a pointed critique of simple diffusionist notions in relation to cane propagation in nineteenth- and twentieth-century Mauritius, see Storey 1997:1-3.

22 McCook 2002:4-6.

From the 1880s onward, the use of fertilizer of all kinds is widely evidenced in the Java industry.[23] Imported *guano*, perhaps the richest single source of organic nitrogen, was one possibility, but a sharp and permanent rise in its price a couple of decades earlier (together with doubts about its efficacy on cane) limited its use.[24] Nonetheless, it would probably have been among the constituents of proprietary fertilizers such as '*Salomonson's suikermest* [Sugar manure]', exported to Java by the Netherlands firm of that name.[25] Salomonson's was the fertilizer touted, for instance, by the aggressively 'modern' entrepreneur – he evidently saw himself in precisely those terms – D.J. Jut, who was the owner of the new Soeko Dhono sugar factory in East Java.

Hailed within industry circles as a pioneer, Jut neatly bridged the potential gap between metropolitan big business and Indies-based enterprises. As well as being co-owner of Soeko Dhono, he was employed from 1881 as *inspecteur van suikerondernemingen* (inspector of sugar enterprises) by the Batavia *factorij* of the NHM. It was in partnership with the NHM's Batavia branch – and hence with the local representatives of a major metropolitan-based firm – that Jut had launched Soeko Dhono in the 1870s. As model of what the industry should be like when freed from the 'trammels' of the state-run *Cultuurstelsel*, it attracted the attention of economic liberals, evidently racists, who (inter alia) lauded Soeko Dhono for having a personnel largely made up of 'full-blood' expatriates: such people, it was implied, were better managers than their Indies-born counterparts.[26] Nonsense of this kind may have found an appreciative audience in Holland, but in the Indies it were locally born Dutchmen, most of them Eurasian, who continued to form the mainstay of the industry's staff throughout the late colonial era. Moreover, at Soeko Dhono, the kind of 'free enterprise' espoused by economic liberals clearly had its limits as far as individual initiative was concerned. By the end of the 1880s, Jut

23 For example, the *Koloniaal verslag* (1883:182), remarked on 'the annually increasing use of fertilizer on the cane fields', though without further specification. The fullest colonial-era overview of the increase in fertilizer use in Java from the 1890s to 1914 is Van Deventer 1915:405. This was the fifth volume in a series of handbooks prepared by industry experts and used in the training – in both the Netherlands and Java – of industry personnel.

24 Mathew 1970.

25 In 1904, the same firm was advertising 'Ohlendorff's Soluble Peru Guano [...] Special Fertilizers for Sugar Cane, Tobacco…and all other Fertilizers for Tropical Crops', and their availability in Java through agents in Surabaya, Yogyakarta and Semarang (see the advertisement pages of *Handboek* 1904). For Salomonson, see Sluyterman 2005:33.

26 Lisse 1883.

had been bought out by the NHM, and his factory became part of one of the colony's largest sugar-manufacturing conglomerates.

Meanwhile, Jut himself had also been something of an industry activist. In the late 1880s he was chairman of the newly formed Vereeniging van Soerabaiasche Suikerfabrikanten (Association of Surabaya Sugar Manufacturers), precursor of what were to become increasingly effective industry pressure groups. On the business side, as well as Soeko Dhono, he also had a stake in a number of other enterprises in the colony, including a share in two more East Java sugar factories (Peterongan and Sroenie), as well as in a timber concession (Gondang) that was presumably intended to produce firewood for the furnaces of the sugar factories that lay to its south in the hinterland of Surabaya. In addition, he forged financial links with the Koloniale Bank, one of the new metropolitan financiers of the sugar industry that emerged around 1880. It was this bank that provided capital, to the tune of nearly 700,000 guilders, for the new Seloredjo sugar factory (likewise in East Java), in which Jut was a partner. All in all, it was a substantial portfolio of interests and investments, and hence it is hardly surprising to find him described by a latter-day industry executive as a man who 'took a prominent place among the sugar men of his day'.[27]

Jut's pioneering efforts at Soeko Dhono and elsewhere in East Java belonged, nonetheless, to the relatively early days of the fertilizer revolution. At that time, imported *suikermest* was still sufficiently expensive for it to be confined to ratooned cane (that is, cane grown from the stumps of the previous season's crop), where the outlay on fertilizer could be set against the savings on labour costs contingent on not having to replant cane annually.[28] Indeed, Jut was at one with his contemporaries in the 1880s in using *bungkil* as his main source of manure. Initially an exclusively local product, during the closing decades of the nineteenth century it also began to be imported in substantial quantities from the Indian subcontinent, from China and from Holland (probably as a re-export from West Africa): between 1880 and 1900 oil cake imports soared from

[27] Jaarverslag NHM Factorij Batavia, 54 (1878-79), pp. 48-9, 56 (1881), p. 22, in: NA, NHM, 2.20.01, inv. nr. 4552; Inspectierapport Soeko Dhono, 1887, in: NA, NHM, 2.20.01, inv. nr. 7937; 'Gedenkboek Koloniale Bank', p. 27, in: NA, Cultuur-, Handel- en Industriebank; Koloniale Bank; Cultuurbank NV (Cultuur-, Handel- en Industriebank), 1881-1969, toegangsnummer 2.20.04, inv. nr. 883.

[28] D.J. Jut, 'Nota over de grondbewerking en bemesting van suikerriettuinen, zoo als die worden uitgevoerd voor de vrije suikerfabriek Soeko Dhono, gelegen te Modjo Agoong, afdeeling Modjo Kerto, Res. Soerabaia op Java', 31-12-1881, in: NA, 2.20.01, NHM, inv. nr. 9209.

a little over 4 MT annually to 8,000 MT, and probably peaked around that figure early in the twentieth century (oil cake disappears as a discrete item in customs data in 1903).[29] From then on, however, oil cake was entirely outclassed in value by chemical fertilizers, primarily with sulphate of ammonia – the soon to be ubiquitous ZA – as their base.

First and foremost, the price was right. Between 1880 and the early 1890s, the British (and hence, international) price of sulphate of ammonia had fallen by almost 50 per cent, from twenty pounds sterling per (long) ton to just over eleven. The price bottomed out in the late 1890s at around seven and a half pounds sterling.[30] Largely through the agency of the sugar companies themselves and their associated businesses, imports of chemical fertilizer, most of it from the United Kingdom, the Netherlands and Germany, boomed. In this respect, the most significant operation was that of the so-called Mestfabriek Java (Java Fertilizer Factory), located in Semarang. Despite its name, its chief business appears to have been the importation of fertilizer from overseas. Established in 1886 (as the Mestfabriek Semarang) by individuals associated with the pioneering Proefstation Midden-Java (Central Java Sugar Research Institute) there, it was taken over at the turn of the century by the Batavia-based plantation and business house of Maclaine Watson & Co. Together with their associates in Semarang and Surabaya, they constituted one of the very biggest of the Indies firms engaged in the sugar trade. By the 1920s, the Mestfabriek had become a heavily capitalized enterprise with more than a million guilders invested in its operations, and offices in Surabaya and Cirebon as well as in Semarang. Its business was then described as 'the preparation, purchase, importation and sale, and acceptance on consignment, of all kinds of fertilizers, chemical and [other] necessities for the Plantations and industries of the Netherlands Indies'.[31]

ZA had become big business, and by 1914 accounted for around 5 per cent of the total value of all non-government imports into the Netherlands Indies as a whole.[32] Within Java, meanwhile, a network of

29 S. Brown 1981.

30 Bradbury & Hirsh's review of the market for sulphate of ammonia during 1890 (London, [1891]). There is a copy of this pamphlet in the file 'Diverse Bemesting', in: NA, NHM, 2.20.01, inv. nr. 7964. For subsequent prices, see Partington and Parker 1922:125, 129-31.

31 Leidelmeijer 1997:232; *Handboek* 1903:778, 1925:1469; *First hundred years* 1927:11-2.

32 Between 1880 and 1900, fertilizer imports increased nearly tenfold in value from less than 500,000 guilders per year to somewhat under 5 million guilders per year. Already by 1901, ZA were worth around

railways, light railways and tramways was sufficiently evolved by 1900 for chemical fertilizer to be distributed conveniently and cheaply to virtually any part of the island. While sugar remained their single most valuable item of bulk haulage, fertilizer (in its organic and chemical forms) became an important item of freight for such railway companies as the Semarang-Cheribon Stoomtram Maatschappij, whose lines by 1900 serviced the great majority of the sugar factories located along the north coast of Central Java. The Stoomtram Maatschappij had been carrying increasing quantities of oil cake along its lines since its records began early in the 1890s. During the first decade of the new century ZA largely took its place, such that by 1908 the company was carrying around 7,000 MT of the fertilizer annually on its lines along the north coast of Central Java. By 1913 it was carrying around 11,000 MT.[33]

By this date, ZA had established itself as the quintessential fertilizer for Java's cane fields.[34] Hailed in industry circles as 'of indispensable importance for the agriculture of sugar', it was lauded as 'the most used and the foremost among the nitrogen combinations consumed in the Indies'.[35] Application rates per hectare rose sharply during the first decade of the century. Indeed, at many factories, they registered a 100 per cent increase over the decade prior to 1914, by which time the Java average was nearly four quintals (that is, 400 kilo) for every hectare of cane. ZA use peaked a decade later at over five quintals.[36]

eight times as much in value as was oil cake (4,230,882 guilders as opposed to 651,000 guilders). For the period 1880-1908, these figures are taken from *Statistiek van den Handel, de Scheepvaart en de In- en Uitvoerrechten in Nederlandsch Indië over het jaar … Samengesteld bij het Departement van Financiën*. For the period 1909-1914, the figures are from this publication's successor, *Statistiek van den Handel en de In- en Uitvoerrechten in Nederlandsch-Indië over het Jaar… Samengesteld bij het Hoofdbureau der In- en Uitvoerrechten*. I am grateful to Jasper van der Kerkhof for locating and processing these data.

33 Jaarverslagen van de Chef der Exploitatie, 1895-1914, in: NA, Semarang-Cheribon Stoomtram Maatschappij, 1893-1946, toegangsnummer 2.20.17, inv. nrs. 8, 9.

34 Van Houwelingen 1904. England was identified as the biggest single supplier: 19,280 MT in 1903 (or 3,110,000 *picul*) at a cost of 16 guilders per quintal or 10 guilders per *picul*.

35 Van de Leemkolk 1915:99.

36 Van Deventer 1915:408; Booberg 1927.

LABOURING IN THE CANE FIELDS: THE MAKING OF AN INDUSTRIAL WORKFORCE

In some sectors of late nineteenth-century commercial agriculture worldwide, it has been argued, the take-up of fertilizer was a response to a shortage of labour. In the American south in the post-bellum decades, in particular, fertilizer was said to make up for the loss of plantation labour consequent on the abolition of slavery: less land could be brought under the plough for 'commercial crops', but recourse to fertilizer enabled output to be maintained or increased.[37] In late colonial Java, however, a precocious appetite for fertilizer was a response to an abundance of labour and a shortage of land.

From the 1880s onward, work in the industry's agricultural sector, as was also the case in manufacturing, was performed by the wage labour of 'part-time' peasants or quasi-proletarians. The distinction is largely semantic. The Java industry was lucky in that the same rural depression that 'delivered' farmland for cane planting at distinctly favourable rates (helped along by more than a modicum of chicanery, intimidation and the like) also meant that wages were low, and could be lowered to near starvation levels. Most of Java's increasing number of (functionally) landless workers had nowhere else to go, either literally or metaphorically. In consequence, Java's colonial sugar producers entered the age of mass production with a potential labour force whose size and low-cost character made them the cynosure of rival industries. Java was famed for having 'the cheapest labour among the sugar producing countries of the world'[38] and as a place where, in contrast to the norm, it was labour rather than land, which was 'so abundant and cheap'.[39]

Nonetheless, massive labour inputs per se were not the key to developments. The outstanding productivity of Java's late colonial cane fields has sometimes been attributed largely to one particular agricultural technique that crudely exploited the island's ostensibly inexhaustible supply of labour: the so-called 'Reynoso System' of cane planting. This is wrong. In fact, the development of the much-vaunted 'system' was neither as ubiquitous nor as efficacious as might be thought. Alvaro Reynoso (1829-1888) was a Cuban whose book, advocating a (back-

37 See, for example, Wines 1985:158 and the references therein.
38 Maxwell 1927:7.
39 Prinsen Geerligs 1912:124.

breaking) system of trench-digging in sugar fields, a system designed to force the deep-rooting of cane and thereby significantly improve its growth, had been translated into Dutch shortly after the appearance of the Spanish original in the 1860s. A modified version of his system was already implemented in Java a decade later (and hence well before the 'fertilizer revolution' and the great increase in cane yields that it brought in its wake), where the greater availability of the necessary labour make it a much more practicable proposition than was the case in the Caribbean.[40]

Back-breaking work in the sugar field: The Reynoso system of cane planting in operation in East Java, 1921 (KITLV 30198)

Nonetheless, it was never the industry's universal mode of cultivation, and deep ploughing – rather than the (manual) trenching central to

40 See Moreno Fraginals 1976:91-3, for a description of the system and a reproduction of the frontispiece of the Dutch version of the book (*Verhandeling van Don Alvaro Reynoso over de cultuur van suikerriet*), translated by Servaas de Bruin 'en voor het wetenschappelijke en praktische nagezien' by 'J.E. de Vrij & J. Millard', Rotterdam: Nijgh, 1865. During the 1870s, 'Reynoso' was widely taken up in Central Java, both along the north coast and in the interior, as well as in West Java (Cirebon).

'Reynoso' – was and remained a very real option where soil and climatic conditions made it a viable (and cheaper) alternative. Indeed, the popularity of 'Reynoso' among manufacturers varied considerably over time: for instance, there was said to have been a reaction against it (in favour of ploughing) during the 1880s, followed by a later swing back. As one authoritative writer remarked in the 1920s, 'this constant alternation between one method of working and the other shows quite clearly that there is no great difference in the results that can be obtained'.[41] In short, while Reynoso certainly played a role in the emergence of agro-industry in Java sugar, it was only one among several factors that included an extensive programme of R&D and a recourse to chemical fertilizer to an

Javanese women at work in the sugar fields: Weeding the cane, around 1910 (KITLV 5178)

41 See Van Deventer 1927:188-9. Van Deventer's work was issued with the 'imprimateur' of the sugar syndicate and this updated edition of the original book (according to its frontispiece) was 'herzien en bijgewerkt door het Proefstation voor de Java Suikerindustrie'. In reaching this conclusion, Van Deventer drew on the published research of Van der Zijl 1922. The section of Van der Zijl's report on which Van Deventer drew his conclusion that '[u]it de samenvatting der proeven over dit ontwerp door van der Zijl, blijkt, dat van een voordeel van ploegen over Reynoso niets blijkt; eerder is een gering voordeel in de omgekeerde richting te zien', is Van der Zijl's discussion of 'Ploegen tegen Reynoso', pp. 160-6.

extent that was without parallel in comparable tropical and sub-tropical cane sugar industries. Most important of all, however, techniques of planting were no more than one dimension of an evolving agro-industry in the field, characterized by an elaborate division of labour along industrial lines (including, inter alia, a very high degree of informed and informing supervision) and by very significant developments in the gendering of the workforce, which brought women (and children) very much to the fore.

THE DIVISION OF LABOUR, MANUAL WORK AND MACHINES

The evolution of agro-industry in the field has been commonly equated with the advance of the machine and the (partial) suppression of manual labour. Late colonial Java stands as a contrary instance. 'Industrialization' was located in work processes rather than in machines, and mechanical solutions to agricultural problems played only a minor part in the changes that took place. To be sure, the Java factories toyed from time to time with the implementation of mechanized ploughing and mechanized digging of the trenches in which cane was planted.[42] Altogether more significantly, they exploited mechanized means to rail cane from the field into the factory.[43] Essentially, however, from the late nineteenth century onward, growth was based on a labour-intensive, yet simultaneously industrial, regime. Within the parameters of the intensive exploitation of manual labour, the essentials of industrial production came to be found as much in the field as in the factory. Contrary to what has sometimes been argued, however, low wages and the (relative) abundance of labour did not have an inhibiting effect on significant advances in agricultural practice and techniques.[44] In fact, as the case of Java convincingly demonstrates, the two were far from being polar opposites. The industry's achievements in the cane field stemmed from the extent to which sugar plantation agriculture in Java became, at one and the same time, both labour-intensive *and* industrialized in so far as the labour process was concerned.

42 See, for example, *Rapport machinale grondbewerking* 1920.

43 By the 1920s, the industry boasted some 10,000 kilometres of rail track (Van der Mandere 1928:57).

44 The classic statement is Lewis 1978. For a critical engagement with Lewis's argument in a New World context, see, for example, Dye 1998:69-70.

The defining characteristics of an industrial workforce are not of an absolute kind, nor are they predicated on a sudden 'revolutionary' transformation.[45] They relate to the provenance of labour, how labour is disciplined and subordinated to capital's requirements, the nature of those requirements as reflected in the division of labour into discrete tasks, and – critically – the supervision of those tasks. Last but not least, the industrial character of a workforce is closely related to the productivity of labour and the existence of what might be styled a 'discourse of productivity'. The key argument here is that although sugar labour in Java has commonly been designated as 'cheap' and 'plentiful', in fact this designation is highly questionable. Least of all did it preclude typically capitalist calculations about the exploitation of labour.

The process of creating a disciplined, industrial workforce out of landless and marginalized peasants had begun in Java in the middle decades of the nineteenth century, under the aegis of the *Cultuurstelsel*. Java's colonial sugar industry benefited greatly from the re-location, in the 1830s and 1840s, of its major centres of production into, or into the proximity of, some of the most densely settled rural localities in the whole of Southeast Asia. A large-scale, and often brutal, commandeering of labour could be sustained because skewed access to resources in the Javanese countryside meant that a growing number of (functionally) landless peasants could be mobilized to meet the needs of the sugar industry.

Only in the final decades of the nineteenth century, however, did the Java sugar factories began to convert the colony's potential for 'cheap labour' into an effective, industrial-style workforce. In so doing, they were able to take advantage of the fact that their predominantly seasonal workforce came to be comprised – predominantly – of men, women and children for whom wages, gleaned whenever and wherever they might be found, formed an essential element of subsistence.[46] For the industry, this was not an entirely one-way street. Rural labour shifted, sometimes uneasily, between a variety of employers, some of whom were peasant landholders and some not. It did so, moreover, in ways that did not always suit the sugar industry. At various times and places this caused dismay, even alarm, in industry circles. Nonetheless, for the most part the industry had the upper hand.

45 I have drawn here, inter alia, on Mathias 1996:40-3.

46 For an elaboration of the discussion in this and the following paragraph, see Knight 1994.

THE PROVENANCE OF LABOUR

In the late nineteenth century, much of the industry's multi-faceted workforce was recruited within the locality of the factory. Ambulatory, migrant labourers, nonetheless, began to make up a proportion of the workforce that increased in importance early in the twentieth century. Labourers of this kind, particularly those engaged in the heavy work of 'opening' the land prior to cane planting, appear to have begun to move from factory to factory, a migration made technically feasible by the new railways (with very cheap fares for 'native' passengers) and made possible because the factories in Java's drier east usually began field operations earlier than their counterparts further west. Sometimes these migrants were housed in '*coolie kampongs*' specifically erected close to the factories. By the early twentieth century, workers' quarters of this kind – some of them no more, perhaps, than rural shanty towns, others more formally laid out by the sugar company concerned (and proudly photographed by them) – were an important feature of factory life.[47] Late in the nineteenth century, however, it looks as if many of the temporary workers who were drawn from further afield made what arrangements they could to find lodgings in the villages around the factory which employed them

LABOUR RECRUITMENT AND BONDING

The sugar industry's control over labour had evolved considerably since the middle decades of the nineteenth century, when a great deal of work in the industry had been 'compulsory' in the sense of being carried out on the basis of the peasantry's (presumed) obligations to perform *corvee*. From the 1860s onward, what was designated in colonial terminology as 'free labour' became increasingly characteristic of the industry's operations. By the late nineteenth century, a key element in the evolution of 'free labour' was informal arrangements for bonding of various kinds. Designed to secure a regular turnout and to circumvent the enticements of other employers, the usual arrangement was for the factories themselves – or their Javanese 'foremen' (*mandur*) – to recruit workers on the basis of cash advances. During the opening decades of the twentieth

47 For a description of the mid-twentieth-century situation regarding worker housing around the sugar factories of East Java, see Sulistyo 1997:112.

century, factory records began to distinguish between informally bonded labourers and those who, from the perspective of factory managers at least, turned out to work of their own accord. Nonetheless, their actual status was ambiguously located in a network of obligations incurred within villages and among the work gangs that were characteristic of at least some sectors of sugar industry production.

Some employers turned to labour contractors to supply part of their workforce. At the big Wonopringgo sugar factory on the north coast of Central Java, for example, an Indies-Chinese contractor supplied much of the labour required during the campaign. He appears to have found some of his workers in impoverished districts further along the coast, where, among other things, he owned a number of ice factories (which may have served as recruitment centres). Already in place in the 1890s, the arrangement continued in force until the eve of the interwar depression some four decades later. The original contractor himself grew rich enough to afford to have his son trained as an engineer, and the same man was for a time a member of the colonial government's consultative assembly, the Volksraad. His father (died 1930) built himself a colonial-style mansion in the locality – it was still standing at the end of the twentieth century – and appears to have enjoyed a patriarchal relationship in the surrounding district strong enough to ensure his family's survival through the political and social upheavals of the mid-twentieth century.[48]

WOMEN AND CHILDREN IN THE SUGAR FIELDS

From the late nineteenth century onward, the labour of women (and children) became a feature of Java's cane fields on a historically unprecedented and vital scale. Indeed, a radical shift in the gender composition of the workforce was central to the evolution of that agro-industry that was so critical to Java sugar's ability to re-invent itself in the context of the age of mass production. The immediate background was to be found, so it would appear, in the deflationary economic conditions in rural Java

[48] I have derived the information in this paragraph from a letter from Han Bing Siong (grandson of the Pekalongan labour contractor Hoo Tjien Siong, aka Bah Sin Song), Rijswijk, the Netherlands, 3 April 1995 (in the possession of the author). Han Bin Siong kindly wrote to me that while attending his brother's funeral in Java in 1987, 'I was surprised to hear Indonesians saying to each other: he is the grandson of Bah Sin Song. That after 57 years they still knew my grandfather's name moved me deeply.'

which, as we have already seen, impacted on the price of rice in the final two decades of the nineteenth century. It was this same phenomenon that also enabled the industry to depress wages to near-subsistence levels. The industry was now able to recruit women, adolescents and children into the workforce; they were obliged to seek wages 'outside' the village to an extent, and with a consistency, that was apparently quite novel.[49] The success of the agro-industrial project was dependent, in short, not only on the availability of labour but on what *kind* of labour was available. Women and children began to enter the formal workforce as never before. Largely unknown (so it would seem) in the cane fields prior to the 1880s, fifty years later they constituted a little under half (44%) of the people employed there.[50]

Most immediately, the availability of the cheap labour of women and children enabled elaborate routines of fertilizer application to be put in place at minimal cost. Women, together with children, were also heavily involved in the planting of cane (indeed, so much so as to make it impossible to provide discrete numbers for those involved in the fertilizer programme alone).[51] In total, they came to form a substantial part of the industry's workforce: at one reasonably typical factory on the north coast of Central Java in June 1908 for instance – June was a peak month of activity – there was a daily average of 1,119 women and 899 children working in the plantation, together with over 3,000 men.[52] The success of the agro-industrial transformation of the cane field was largely predicated on them. Commensurate with the influx of women and children into the sugar workforce, as keen-eyed colonials were quick to note, was

49 See the local-level reports on rural conditions collected by Dutch officials around the turn of the century (see, for instance, *Mindere welvaart Banjoemas* 1908:46; *Mindere welvaart Kediri* 1908:57). In dealing with prostitution, in particular, the compilers of *Onderzoek naar de mindere welvaart der inlandsche bevolking op Jawa en Madoera* picked up information about social and economic trends in the countryside that went far beyond the immediate issue on hand. 'Informal' (the usual term was 'clandestine') or casual prostitution was judged to be much on the increase in some areas, the proffered explanation for which was the novel situation of men and women working alongside each other in sugar field and factory (see, for example, *Mindere welvaart Pasoeroean* 1908:34; *Mindere welvaart Soerabaja* 1909:24).

50 For an introduction to the issue of women in the workforce in nineteenth-century Java, see Boomgaard 1981. For general data on of the participation of women and children in the industry's early twentieth-century field and factory workforce, see Levert 1934:119-21, 125-7.

51 At many factories, such as Soeko Dhono in the early 1880s, cane planting was quite explicitly women and children's work, see D.J. Jut, 'Nota over de grondbewerking en bemesting van suikerriettuinen, zoo als die worden uitgevoerd voor de vrije suikerfabriek Soeko Dhono, gelegen te Modjo Agoong, afdeeling Modjo Kerto, Res. Soerabaia op Java', 31-12-1881, in: NA, 2.20.01, NHM, inv. nr. 9209.

52 Jaarverslag Sf. Ketanggoengan-West, 1908, pp. 3-4; 1911, p. 11; 1913, p. 10, in: NA, NHM, 2.20.01, inv. nr. 9372.

The planting of cane was largely women's work: A Javanese sugar field in the early stages of planting-out, 1921 (KITLV 30189)

an all-round reduction in wages and an increased facility, on the part of the management, for subordinating the industry's workforce as a whole. Around the turn of the century, it was widely reported that wages were considerably lower than had been common in rural employment only a few years earlier.[53] This may, of course, simply have reflected general, deflationary conditions in the countryside. Nonetheless, it was still possible for women and children employed in the industry to be described as '*scandalously* badly paid'.[54]

LOW WAGES AND INDUCEMENTS TO LABOUR

Even so, there appear to have been limits to how low payments could get. In 1886, at a time when the industry was desperately casting around

53 For the north coast of Central Java, see, for instance, *Mindere welvaart Pekalongan* 1908:46. For a broad overview and selected data on wages in the Netherlands Indies, see Dros 1992.

54 See the comments, circa 1904, of an elderly Christian missionary teacher ('*zendelingsleeraar*') who had been based in East Java for some fifty years, printed as Appendix 8 in *Mindere welvaart Soerabaja* 1909:161.

for ways of cutting costs in the wake of the collapse of the world price for factory sugar two years earlier, the NHM's superintendent of sugar factories, Steven Everts, sounded a note of caution. In confidential response to suggestions emanating from company directors in Amsterdam that wages in the Java sugar industry could be drastically reduced – they were reputed to have been cut by 50 per cent in Cuba – he warned that if wages were cut on that scale in Java, then the industry might as well shut down. No workers would turn out for wages as low as that. Everts, who had been in sugar for a decade or more, and was later to become a leading industry executive, could hardly be suspected of being a bleeding heart. What concerned him was that although the industry did indeed provide employment for a great many people, 'if we cut wages by 50%, employment in the industry is not so indispensable to these people that they will not be able to find a livelihood by other means'. He was certainly keen to reduce payments over a range of tasks – and indeed had already done so – but he also recognized the importance of increasing the productivity of labour. In this context, he was evidently acutely conscious of the fact that attempts to cut wages were met with a fall-off in the amount of work actually done.[55]

This said, industry wages were low, and one aspect of the sugar factories' ability to attract workers undoubtedly had to do with their general mode of payment. As one north-coast manufacturer observed in the 1890s, the reason why people worked for 'such low wages' was that they got paid in coin at the end of the day, something which he implied could not be relied upon if they worked instead for fellow villagers.[56] Indeed, from elsewhere in the colony during the same decade, there is testimony that the establishment of sugar factories was viewed with dismay by the more substantial (landholding) peasants, not least because of the threat that the factories posed to their control over labour.[57] What the factories could also offer, moreover, was ready access to consumables. Early in the twentieth century, for example, the management of a factory that was located at some distance from the nearest town was very much alive to

55 Everts to NHM Factorij Batavia, 9-11-1886, in: NA, NHM, 2.20.01, inv. nr. 7936.

56 See, for example, the comments of the administrateur of Sf Kemantran (Tegal) circa 1894 'dat de bevolking met deze lage verdiensten werken wil, volgt hoofdzakelijk uit contante betaling', NA, NHM, 2.20.01, inv. nr. 7963.

57 See, for example, Schmalhausen 1909:12.

the advantages of having *pasar* (markets) and *toko* (shops and stalls) established in its vicinity.[58]

There were, of course, other forms of consumption, and although drugs, gambling and prostitution are ill-documented in relation to the sugar industry's operation, there can be little doubt that they played a significant role in attracting and retaining workers. It was entirely typical, for instance, that in seeking to explain the upsurge of opium sales in the sugar-rich residency of Pasuruan in the late 1910s, the government officials in charge of the state's opium monopoly confidently ascribed it to the fact that the sugar factories were back working at full capacity, and hence there was a great influx of labourers from other areas: use of the drug was widespread among the 'coolies' who serviced the sugar industry and other Western estates.[59] Indeed, there were outlets for the sale of opium – in the minute quantities that the workers could hope to afford – at many sugar factories, particularly the ones not located close to a town.[60] Gambling was also presumably endemic.

So, too, was prostitution, though evidence is somewhat scant. A degree of 'license' in the relations between the sexes among factory employees was certainly in evidence. One affronted company inspector reported to his superiors – the year was 1885 – on the way in which 'coolies' had not only smoked cigars while answering his questions, but also openly engaged in what he described as a 'romp' ('*al stoeijende*') with a woman of their number, who was half stripped and plastered with wet clay.[61] Sex as a commodity, of course, was nothing that even the most strait-laced inspector could do anything about, even had he wanted to. Heterosexual prostitution per se was little commented upon in industry sources, but given the substantial presence of young males in the workforce, and the unusual degree of their concentration in specific localities, it must inevitably have constituted one of the attractions of industry work. The tip of this particular iceberg is readily discernable, for instance, in the local-level reports on rural conditions published during the opening

58 Jaarverslag Sf. Ketanggoengan-West, 1906, (unpaginated); 1907, p. 35, in: NA, NHM, 2.20.01, inv. nr. 9376.

59 *Verslag Dienst Opiumregie* 1920:12, 1921:14. For an extended discussion of opium consumption in early twentieth-century Netherlands India, see Chandra 2000.

60 In 1930, for example, there are opium sales outlets at the following 'isolated' sugar factories in the residency of Pekalongan: Wonopringgo, Sragie, Tjomal and Petaroekan; see J.J.M.A. Popelier, 'Memorie van Overgave van de residentie Pekalongan', 1931, pp. 65-6, in: NA, Memories van Overgave, 1852-1962, toegangsnummer 2.10.39, inv. nr. 46.

61 D.J. Jut to Factorij NHM Batavia, 4-11-1885, in: NA, NHM, 2.20.01, inv. nr. 7944.

decade of the twentieth century in the great official investigation known as the *Onderzoek naar de mindere welvaart* (Inquiry into diminished welfare). What colonial officials described as 'clandestine' or casual (as opposed to *officieele* or 'registered') prostitution was reported as being widespread in the neighbourhood of sugar factories. It was often linked (in the official mind at least) to the novel presence in the industry of women working alongside men, and to the increasingly itinerant nature of a substantial part of the industry's field workforce.[62] In some localities, at least, unfavourable economic conditions in the country in general were said to be responsible for the growing number of girls and young women who sought to gain, or augment, an income by selling sex.[63]

THE DEVELOPMENT OF TASK WORK

On these several bases of recruiting and retaining labour, a situation evolved fairly rapidly in which the regimented, closely supervised and task-differentiated labour of large numbers of workers could be brought to bear on every aspect of the production of cane. Indeed, by the early twentieth century, the industry's field workforce was largely organized – and paid – in terms of task-work which might be divided into as many as sixteen categories;[64] in addition, the force was categorized in a variety of forms extending from 'gully coolies' (the people who dug out with hand tools the trenches in which cane was planted) to the 'weed women' (who kept the growing cane free of undergrowth).[65]

The fertilizer revolution per se was heavily dependent on elaborate and labour-consuming routines for ensuring that the fertilizer penetrated the soil around the roots, and that it did so in appropriate rather than merely random quantities. As early as 1882, for example, Jut was able to report that at his 'progressive' Soeko Dhono factory in East Java the procedure was for fertilizer to be carried by children in baskets along the rows of cane, and strewn around each plant in a measured amount, after

62 For example, *Mindere welvaart Pasoeroean* 1908:34; *Mindere welvaart Bĕsoeki* 1909:33; *Mindere welvaart Banjoemas* 1908:24; *Mindere welvaart Madioen* 1908:26; *Mindere welvaart Kĕdiri* 1908:30.

63 For instance, *Mindere welvaart Kĕdiri* 1908:30.

64 For example, Jaarverslag Sf. Wonopringgo (Central Java), 1913, p. 4, in: NA, NHM, 2.20.01, inv. nr. 9402; Jaarverslag Sf. Gending (East Java), 1927, p. 35, in: NA, Cultuur-, Handel- en Industriebank, 2.20.04, inv. nr. 1150.

65 For a detailed discussion, see Knight 1994.

which a 'coolie' (Jut's term), following behind, worked the fertilizer into the ground with a *pacul* (a kind of spade-cum-hoe indigenous to Java).[66] According to an account published in 1901 – and evidently intended both as description and guide to those who might be new to the use of ZA – at many factories the fertilizer was first mixed with water in a bamboo container or box. Subsequently, women worked their way through the rows, delivering a fixed measure of the liquid fertilizer to each clump of cane. The writer thought that it might pay, at least on heavier soils, to first make a hole near the plant, into which the liquid might be poured.[67] Subsequent reportage was of routines that involved two, three or even four successive doses of fertilizer during the course of the season. At some factories dosage was standardized in the form of tablets of compressed ZA, for which purpose a Dutch firm invented a small machine to enable them to be fabricated on the spot.[68]

INFORMED AND INFORMING SUPERVISION

The importance of supervision in the evolution of industrial work processes has long been recognized.[69] Java sugar was no exception. A vital ingredient in the agro-industrial transformation of the cane field was an informed and informing system of supervision that enabled 'cheap' labour to be transformed into the basis of large-scale, low-cost production. Inter alia, the importance of field supervision in this context was clearly reflected in what people were paid – the bottom line that mattered most when it came to the closely watched and calibrated hierarchy of employment that counted for so much among industry personnel. At most factories, it can safely be said that the individual who was designated as the person in charge of cane plantation was paid as much, or even more, than the 'first engineer' who was in charge of manufacturing. Only the

66 D.J. Jut, 'Nota over de grondbewerking en bemesting van suikerriettuinen, zoo als die worden uitgevoerd voor de vrije suikerfabriek Soeko Dhono, gelegen te Modjo Agoong, afdeeling Modjo Kerto, Res. Soerabaia op Java', 31-12-1881, in: NA, 2.20.01, NHM, inv. nr. 9209.

67 Bruyn 1901; Jaarverslag Poerwodadi, 1910, p. 4, in: NA, NHM, 2.20.01, inv. nr. 9391.

68 Van Deventer 1915:417.

69 For an elaborated discussion of the role of *supervision* in capitalist industrialization, see Chakrabarty 1989:68-9.

administrateur earned more, with a salary perhaps a third higher again than that of his two chief subordinates.[70]

Supervision on the requisite scale – and it was a huge scale – was made feasible by a number of factors. Not least was the fact that Java's sugar companies could draw on the island's old established Eurasian, 'Indies-Dutch', communities to fill the upper ranks of their field staff. Legally and socially assimilated to the *totok*, expatriate arrivals from metropolitan Europe, these communities provided recruits whose ostensible familiarity with 'the natives' purportedly gave them an edge over Dutch expatriates. As one contemporary remarked in the 1920s, a deep familiarity with 'land en volk' was vital for staff that had a 'continuous contact with the native workforce'.[71] A survey done in the 1920s confirmed that the great majority of the industry's Dutch field employees were Java-born – and therefore preponderantly Eurasians.[72]

Well before that, in the late 1880s, industry bodies had already established training courses 'where youths, born on Java, will obtain the knowledge necessary for the growing of sugar'.[73] This proved to be the precursor of elaborate and ongoing training programmes for industry field staff. In 1926, for instance, the industry's research institute at Pasuruan, in heart of the East Java sugar belt (see below), hosted a seven-day course for cane planters, provided at the industry's expense.[74] In all, between 1913 and 1940 the industry provided fifteen such courses (they were suspended between 1932 and 1938) to some 1,250 individuals.[75] In this context, the detailed and precise instructions for cane planting found in contemporary manuals for the education and use of European field supervisors tell their own story (albeit a presumably somewhat idealized one), as do injunctions to let nothing slide when dealing with the field work of the native workforce: 'from the outset one needs to keep a sharp

70 The data here are from the middle-sized Wonolangen sugar factory in East Java. I am confident, however, that relative salaries at this middle-sized and long-established enterprise were roughly comparable with those throughout the industry in the 1920s (Jaarverslag Wonolangan, 1926, p. 1, in: NA, Cultuurmaatschappij Wonolangan te 's-Gravenhage (Cultuurmij. Wonolangan), 1895-1963, toegangsnummer, 2.20.02.03, inv. nr. 114. Wonolangan's *hoofdtuinopzichter* (chief plantation supervisor) earned 650 guilders per month, the same base salary as the *eerste machinist* (first engineer). The base salary of the *administrateur* was 1,000 guilders per month.

71 Romer 1921:288.

72 In the case, for example, of *assistent tuinopzichters*, about 80% were born in the Indies. For a detailed analysis of the European/Eurasian personnel of the industry, see Tichelaar 1924, 1925.

73 *Proefstations suikercultuur* 1886.

74 *Cursus rietplanters* 1926.

75 Booberg 1940.

eye open', as one informed and experienced writer remarked, and 'to take a firm line to make sure that they don't get away with anything'.[76]

A group Dutch supervisory personnel at the Tjomal sugar factory on the north coast of Central Java, circa 1918 (NA, Tjomal, 2.20.39)

The functions of professionals of this kind were not confined simply to the supervision of workers; they were key to the assembly of the data on which scientific production depended. Back in the early 1880s, for example, field supervisors at more progressive plantations had already been expected to submit weekly written reports on a pre-printed, standardized form, and similar arrangements had become *de rigueur* throughout the industry by the century's end.[77] Record keeping, moreover, became increasingly meticulous over the years, and lay at the heart of the 'informing' as well as the 'informed' nature of the supervision that was so central a feature of the agro-industry in sugar that characterized the late colonial

76 Van Deventer 1915:232-3.

77 For Soeko Dhono – and for the preservation in the archive of a little collection of these 'Tiendaagsche rapporten' dating from 1882-1885 – see: Dossiers Cultuurzaken, Suikerfabriek Soeko Dhono, 1880-1906, in: NA, NHM, 2.20.01, inv. nr. 7947; Dossiers Cultuurzaken, Suikerfabriek Poerwodadi, 1885-1888, in: NA, NHM, 2.20.01, inv. nr. 7944.

era in Java. To give but one example: at one particular factory in East Java in the 1920s, a total of 634 hectares of plantation, divided into three major subdivisions, embraced a total of some fifty-six 'cane gardens' or *tuinen*. For each of the latter, records were kept not only of cane yields, planting (*aanplant*) costs, cane varieties used and other similarly 'agricultural' matters, but also of the amount of sugar each 'garden' yielded, cane-harvesting costs, transport costs and the precise *rendement* that came from that particular area of cane (which, itself, was of course accurately measured).[78] All in all, record keeping demonstrated a fine 'Germanic' zeal on the part of the Dutch that might have been even more at home further up the Rhine…

Ultimately, nonetheless, supervision was a Dutch enterprise only in part. Indeed, in the final analysis it was the presence of 'native', Indonesian field staff – rather than their European superiors per se – that made possible this kind of near-obsessive, in-depth attention to the plantation. It was, for example, on the information gathering of scores of so-called Javanese '*aanplant schrijvers*' – 'field record keepers', in an approximate translation – that the entire edifice of record keeping depended. The industry itself actively promoted the formation of suitable personnel: there is evidence, for example, that local-level Dutch managers saw the point of ensuing that young people whose Indonesian families were already 'part' of the industry obtained the requisite training, part-academic, part-experiential, to fill a useful future role in the agro-industrial enterprise. As the archive relating, for instance, to one medium-sized factory on the north coast of Central Java makes clear, circa 1910 the *administrateur* had organized for the running of what he called a '*fabrieksschool*', or factory school, for about seventy boys – which was also attended, in the afternoon, by about forty girls.[79]

They were the offspring of the factory's *tukang* (skilled factory workers) and *mandur*, and the boys received instruction in the morning from one of the factory's many Indonesian (field) record-keepers or clerks (Dutch: *schrijvers*), while the girls were instructed in the afternoons by one of the Indonesian staff – presumably a woman – of the factory's laboratory. During the campaign, when an attitude of 'all hands on deck' pre-

78 For the information in this paragraph, see Jaarverslag Sf. Wonolangan 1927, pp. 13-27, in: NA, Cultuurmij. Wonolangan, 2.20.02.03, inv. nr. 115.

79 For the information in this and the following paragraph, see Jaarverslag Kemantran, 1911, p. 6; 1912, p. 22; 1914, p. 23; 1920, p. 23, in: NA, NHM, 2.20.01, inv. nr. 9374.

Laboratory staff, Java sugar factory (unknown), circa 1920 (KITLV 30193, KITLV 18274)

vailed, the students worked in the factory – above all in the laboratory, in the taking of samples and the like – while the more promising ones were enabled to take advanced courses of a kind that the lower-level laboratory staff themselves were not able to provide in the *fabriksschool* itself. Some of the older boys got further experiential training as assistant field record-keepers (*hulp-schrijvers*) and student-draftsmen (*leerling-tekenaar*).

Indonesian field staff and their Dutch boss, Tjomal sugar factory, circa 1918 (NA, Tjomal, 2.20.39)

By the end of the 1920s, the industry employed some 23,000 Indonesian field supervisors, on an average ratio of roughly one full-time individual for every nine hectares of standing cane.[80] Photographs of the Dutch *tuin-employee* and his cohort of a dozen or more Indonesian assistants became a standard feature of the industry's photographic ar-

80 In 1930 there were 12,753 *tuinmandoers* (plantation foremen) and 10,308 *hulptuinmandoers* (assistant plantation foremen) employed in the colonial-Java sugar industry, that is, a total of 23,061 Indonesian supervisory field staff. In the same year, the (harvested) area under cane amounted to nearly 200,000 hectares. See http://www.kitlv.nl/documents/library/Metamorfoze/Indisch%20Verslag/MMKITLV01_PDF_TS2711_1934.pdf, p. 192 (accessed 20-8-2012).

chive, as did a landscape dotted with the white-clad figures of 'native' *mandur* and record keepers.

YIELDING TO NONE: A UNIQUE RECORD OF FIELD PRODUCTIVITY

The fertilizer revolution, and the associated development of industrial agriculture, had far-reaching consequences for the Java industry's location in the international sugar economy. Over a twenty-year period ending in 1913, the island's total output of sugar increased threefold, from 5,000,000 to 15,000,000 MT.[81] This meant that on the eve of the First World War Java more than held its own, along with Imperial Germany and Cuba, in the topmost rank of the world's exporters of sugar. The differences between Java and Cuba as producers of sugar, however, were very striking. Whereas the Java industry entered the twentieth century with substantially improved plantation yields, in Cuba the reverse took place. Between the 1880s and the eve of the First World War, extensification of cane production in the Caribbean island went in tandem with a fall-off in per hectare productivity in the agricultural sector,[82] since it was judged to be economically rational to pay less attention to cultivation on the (correct) assumption that sheer quantity would make up for the lack of quality.[83]

In contrast, it was precisely to improvements in the production of raw material that the Java producers looked for their salvation, with resultant levels of field productivity totally unmatched elsewhere.[84] Of course, Java had long had a record in respect to yields that was exceptionally high by international standards. As of 1894, the average yield of cane already stood at around 68 MT per hectare – in global terms, this in

81 Creutzberg 1975:74-5.

82 The point is discussed and documented in Ayala 1995.

83 Ayala 1995:104-6.

84 On Java's unique position with respect to plantation yields, and a discussion of global comparisons, see Maxwell 1927:50-8. The Hawaiian industry has sometimes been cited (erroneously) as approaching, or even exceeding, Java in terms of plantation yields. This is based on a misunderstanding. Cane yields in Hawaii were indeed high, but to achieve this outcome, cane remained in the ground for much longer than was the case in Java. A detailed account from the late 1920s makes the real position quite clear: Koningsberger (1929) points out that at the Hawaii factories only 50-60% of the cane planted is harvested in any one year, since the cane stays in the ground for around 20-22 months (as opposed to Java's 12-15 months).

itself was a very respectable figure indeed – while a decade and a half later (1908) the figure stood at a spectacular 105 MT per hectare.[85] The result was perhaps even more remarkable than it looked. As one factory *administrateur* in Central Java reported early in the new century, 'sugar production has increased substantially in recent years, despite the circumstance that the plantation has been expanded into what was formerly considered to be unsuitable soil'.[86]

R&D: THE SUGAR RESEARCH INSTITUTE

A combination of the intensive use of organic and, subsequently, chemical fertilizer and the formation of a closely supervised industrial workforce in the field (in which female labour played a major role) contributed mightily – as we have seen – to a field-first strategy in Java sugar. It was one that produced world-beating yields of cane, which compensated to a degree for the industry's inability to create those economies of scale that characterized its great Caribbean coeval and rival. A further key dimension of the entire agro-industrial transformation of the cane field was that it took place within the context of an evolving managerial culture, which placed a high value on research and development.

In the most general terms, a programme of R&D served, as a number of scholars have noted, to legitimize the colonial enterprise in general by linking it to the pursuit and propagation of knowledge.[87] In the specific case of Java sugar, however, long-term legitimacy was closely bound to short-term survival. R&D had begun in earnest in the late 1880s, when the industry found itself faced not only with a serious threat of devastating and little-understood cane disease (*sereh*), but also, and increasingly critically, with the need to reduce costs to levels which made the industry internationally competitive.[88]

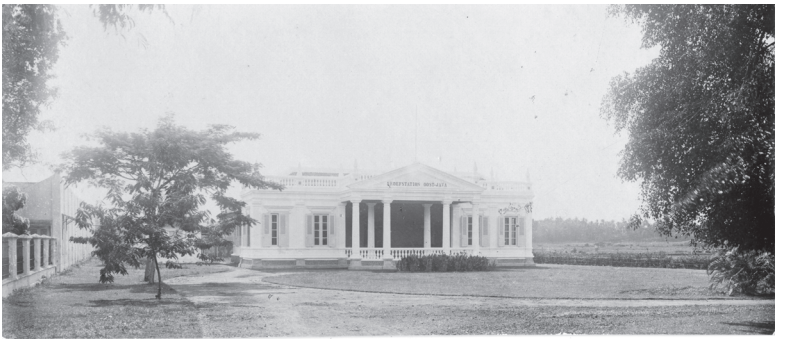
85 Dickhoff 1914:613-4.

86 Jaarverslag Poerwodadi, 1906, (unpaginated), in: NA, NHM, 2.20.01, inv. nr. 9391. The *administrateur* claimed that this had been achieved even despite the fact that the Indies government had made the factory surrender some of its best land for permanent rice production by the peasantry ('*de afname van de beste gronden (Tegallans) door de regeering*').

87 For general discussions, see Goss 2009; Moon 2007; Maat 2001:53-67; Boomgaard 2006.

88 For this and what follows, *AS*, 'Jubileumnummer 1 Mei 1918'; Leidelmeijer 1997:231-48; Van der Schoor 1996; Handojo et al. 1987.

The results were impressive. As the Java industry's own leading savant, H.C. Prinsen Geerligs, was to urge upon readers of the 1904 edition of *The International Sugar Journal*, 'though it is a common saying in Europe that in the tropics the work is done in a rather careless manner, we do not deserve such a reproach in Java, as everything which science and experience can suggest to us as advantageous for our industry is investigated and tried'.[89] The point was subsequently reiterated by Noel Deerr, on his way to becoming one of the international sugar industry's most respected experts, in the observation that 'it is in Java, however, that the scientific study of the cane has reached its highest form'.[90] But it was not only horticultural research in which the Java industry rested its claim to fame. Its leading figure for over a quarter of a century, H.C. Prinsen Geerligs, was primarily a sugar chemist, and the industry proudly boasted that, as a result of the efforts of him and his colleagues, Java's manufacturers were not a whit behind their counterparts in beet sugar industries of central Europe in matters relating to the science of sugar making. Indeed, they claimed that the great E.O. von Lippmann, student extraordinaire of European sugar manufacture, had learnt Dutch specifically to be able to be 'in a position to keep the beet sugar industry abreast of the extraordinary progress of their great competitor'.[91]



Extraordinary progress: The Proefstation Oost-Java or East Java Sugar Research Institute, Pasuruan, circa 1915 (KITLV 153466)

89 Prinsen Geerligs 1904b.
90 Deerr 1911:vi.
91 *Jubileum Prinsen Geerligs* 1916:1221.

The heart of the industry's operations that merited such high praise was the Proefstation Oost-Java (POJ, East Java Sugar Research Institute, hereafter 'the research institute') at Pasuruan, in East Java. Staffed by Dutch and German experts, and funded by the sugar syndicate, it represented the culmination – and centralization – of several industry initiatives geared to experimental work on the agriculture and horticulture of cane that had begun at various locations during the course of the 1880s. The upshot of these pioneering efforts was an industry characterized by a meticulous attention to R&D in the field, which singled it out from virtually all of its global counterparts. Indeed, prior to the 1920s only the much smaller American industry on Hawaii even approached Java in this respect. In Cuba, by way of contrast, field science was famously neglected, and elsewhere in the New World (Louisiana was a possible exception) it was generally only in the 1920s that concerted and consistent attention was paid to the production of cane. In Asia itself, only on the Indian Ocean island of Mauritius was serious effort devoted to the field science of sugar, and that effort had largely collapsed by 1914.[92] In Taiwan, a Sugar Experiment Station appears only to have been set up as late as 1932, under government auspices.[93] In the case of the Philippines, where a research institute most certainly existed in the late 1920s,[94] modernization in the factory was paired with a plantation sector in which agricultural development similar to the Java model was stymied by the fragmentation (tenancy and sub-tenancy) of holdings in the agricultural sector.[95] Outside the immediate region, the sugar industry of north-eastern Australia established a strong record in agricultural science from the late nineteenth century onward, but in terms of size it was dwarfed by the Java industry.[96]

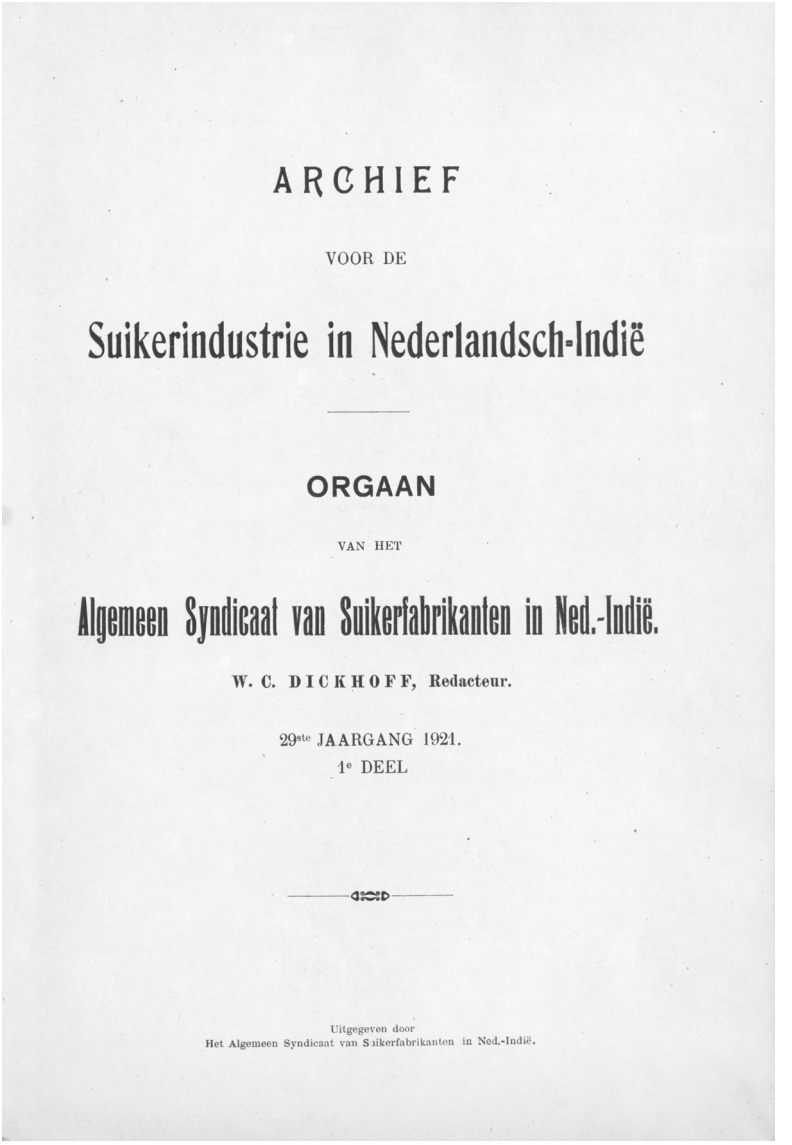
92 For Cuba, see Dye 1998:241-4 (where it is remarked that this neglect was economically quite rational); on science and sugar cane in the 'Spanish' Caribbean, see McCook 2002, where the overwhelming impression is given that until the 1920s, effort was largely or exclusively directed to crops other than sugar – that is, tobacco, bananas and coffee. Louisiana is a more equivocal case; for a discussion of experimentation with fertilizer in Louisiana in the 1870s, see Heitman 1987:62. On Mauritius, see Storey 1997:69-96.

93 According, at least, to the unsigned article *Taiwan's sugar industry* 1968.

94 Perk 1931.

95 As a leading industry figure in the Philippines industry observed in the late 1920s, the prevailing arrangements for growing cane 'has the disadvantage that the entities involved in the production of sugar in the large central districts aggregate from 1000 to 2000 individuals'. The need to somehow cajole or coerce all these people to see the potential of new techniques and new varieties of cane meant that 'there is [...] an enormous slippage between the obtaining of research results and their application in practice' (Fairchild 1928:53).

96 Griggs 2004.



ARCHIEF

VOOR DE

Suikerindustrie in Nederlandsch-Indië

ORGAAN

VAN HET

Algemeen Syndicaat van Suikerfabrikanten in Ned.-Indië.

W. C. DICKHOFF, Redacteur.

29ste JAARGANG 1921.
1e DEEL

Uitgegeven door
Het Algemeen Syndicaat van Suikerfabrikanten in Ned.-Indië.

The dissemination of knowledge: Title page of the *Archief voor de Suikerindustrie in Nederlandsch-Indië*, 1921

The dissemination of information relating to research and development – much of it carried on at the research institute – was further promoted by the publication of the so-called *Archief voor de Suikerindustrie* (*AS*, Archive for the Sugar Industry; hereafter 'the *Archief*'). An annually produced 'house' journal that was issued in parts during the course of the year, it was an essential part of the project of knowledge for which the industry became famous. Replete from its beginnings in 1893 with information, not only relating to the latest findings on the agriculture and horticulture of cane but also relating to the technology of manufacture, by the third year of its existence (1895) the *Archief* counted among its subscribers 147 sugar factories and associated business houses, 430 factory managerial and technical personnel (*geëmployeerden*) and 74 'private' individuals.[97] Eventually, the *Archief* had notched up sufficient articles and references to field fertilizer alone to fill seven, double-column pages of its cumulative index. Well before the outbreak of the First World War,

Arranged for the photographer: The Dutch and Indonesian staff of the Proefstation Oost-Java, circa 1920, KIT 60028809

97 *Voorwoord* 1895.

however, and already comprising 'no less than forty massive volumes', it was being hailed as a testimony to the 'gigantic work which has been carried out' and to 'the energetic way in which the industry is carried on'.[98]

By the 1920s, when the industry was at its peak, the Pasuruan research institute boasted an on-site staff of around twenty Dutch professionals, divided among its agricultural, technical and chemical divisions, and several hundred Indonesian support staff. Virtually ignored in the research institute's official reports, the latter only rarely emerged from their anonymity, as when, in 1928, one 'Ngasinoh', identified as Hoofdlabatorium Mandoer der Cultuurafdeeling, was given a medal to commemorate thirty-seven years of service. It must he assumed, however, that the availability of such people was essential to the successful implementation of the institute's programmes – not least because they were so much cheaper to hire than their European bosses. Outside the immediate confines of its Pasuruan headquarters, the institute also employed another twenty or so individuals as consultants (*groep adviseurs*), attached to one or other of the regional groupings of factories into which the industry was organized.[99] Housed at Pasuruan in a rather grand building behind a pillared portico, the research institute was funded in the mid-1920s, when industry fortunes were at their zenith, to the tune of more than 1.25 million guilders annually by manufacturers who were keenly aware of its central role in the development of the agro-industrial programme in the cane field and in the never-ending technological advance in the factory itself.[100] It was a role, it must be presumed, with which the radical nationalist activists who fought the Dutch in the mid-1940s were also conversant. In July 1947, faced with Dutch military assault on their nascent Republic, they burnt the research institute to the ground.[101]

98 Wright 1909:359-62.

99 See *Verslag van de Vereeniging het Proefstation voor de Java Suikerindustrie over het jaar 1928*. Data on the Indonesian employees (*personeel*) do not appear in the Proefstation's Annual Reports (where there is simply passing mention in the accounts of '*lagere personeel*'). Handojo et al. (1987:26) state that early in the 1940s there were 236 such employees at Pasuruan. It seems likely that the number would have been significantly higher in the 1920s, when the industry was substantially larger.

100 'Proefstation Oost-Java: Rekening en verantwoording over het jaar 1925', p. 12, in: Koninklijk Instituut voor de Tropen (hereafter KIT), 1773, shows that the research institute's income that year was 1,269,230 guilders. The funding all came from the sugar factories, and was based on a levy of 5.50 guilders for each *bau* (.7 of a hectare) of cane. At this time most sugar factories themselves would be worth something between 3 and 6 million guilders, though some large ones would have been worth very much more than that.

101 Handojo et al. 1987:16.

The Proefstation at war: The destruction of July 1947 (Handojo et al. 1987:28

CONCLUSION: THE LIMITS OF AGRO-INDUSTRY IN THE FIELD

The broad outcomes of the fertilizer revolution and associated developments in the sugar industry of late colonial Java have the potential for radically altering our understanding of the dynamics of this particular branch of commodity agriculture. At least, they are perhaps surprising for those who might still be under the spell of the economically 'retrograde' nature of colonialism in general and of 'the plantation' in particular. For what the Dutch succeeded in creating in Java – for a time at least – was a remarkably sophisticated, technically highly advanced and extremely productive form of agro-industry in the field that totally belied any such notions.

The industry's own triumphalist narrative on this score is, of course, open to question, with respect both to its impact on the 'peasant' agriculture in which it was embedded and its sustainability. A classic argument of the former kind has been that sugar effectively 'gutted' the economy of rural Java, despite providing work for thousands of marginal peasants who might otherwise have found no employment at all.[102] Altogether more significant from the viewpoint of the present argument, however, is the question of sustainability. As we shall see, the industry's experience demonstrated quite unambiguously the pitfalls and limitations perhaps inherent in agro-industry in general and most certainly exhibited in the case of the Dutch colony. However, before continuing with a discussion of the constraints on growth experienced by Java sugar – constraints that had to do only in part with the immediate agrarian and agricultural factors impacting on the raising of cane in early twentieth-century Java – it is first necessary to explain the broader context in which the industry operated, with respect to both the colonial state in which it found itself and the particular way in which production was financed. In tandem, these two factors both facilitated and limited Java sugar's capacity to adapt itself to the age of mass production.

[102] The locus classicus here is the work done in the 1930s and 1940s by the Dutch agricultural expert G.H. van der Kolff (1953:193). Van der Kolff's ideas were subsequently taken up and popularized by the American cultural anthropologist Clifford Geertz (1963). For a cool re-assessment of the impact of sugar cultivation, see Van der Eng 1996:208-30.

Chapter 3

Bureaucracy versus plantocracy

The colonial state and 'Big Sugar'

The contrast could hardly be greater. Early in the twentieth century, the Dutch aristocrat Jonkheer C.H.A. Van der Wijck could be found – inter alia – on the board of one of the major combines or 'agricultural banks' (*cultuurbanken*) that dominated the late colonial sugar industry. A recently retired Governor General, he was evidently a man for whom a revolving door between big business and colonial administration became, late in life, one of the charms of high office. Within much the same time frame, it was likewise possible to find a leading figure in his successor's advisory council (the Raad van Indië) being excoriated in colonial business circles as a notorious 'enemy of private enterprise' (*een vijand der particuliere industrie*).[1] The fact that these two men, Governor General Van der Wijck and Raadslid C.J. de Jaager, held office virtually contemporaneously, speaks eloquently of the complexity as well as the centrality of the relationship between the sugar industry and the late colonial state in the Netherlands Indies.

That relationship was one that did much to promote the interests of sugar capital. The industry could look back on a close association with the Indies government dating from its foundational period (in its modern form) during the middle decades of the nineteenth century. As a result, as has been widely recognized, Java sugar hence enjoyed an intimacy with the Indies government and its bureaucracy (and their counterparts in Holland) to a far greater degree that was ever the case with the other major commodity producers in the late colonial Netherlands Indies.

Nonetheless, that intimacy can easily be misread. Sugar may well have had its hands on the reins of power, but this did not mean it had a free rein. The legacy of state support was ambiguous, not least because

[1] For the comments (by the NHM's Factorij) on De Jaager, see 'Rapport Van Geyt', 23-10-1905, (unpaginated), in: NA, NHM, 2.20.01, inv. nr. 7938.

of the tensions inherent in the particular character of the Java sugar complex. Deeply enmeshed with the peasant agriculture of the island's densely settled lowland districts, the industry came within the quotidian purview of the state to an extent unparalleled in the enclave-style operations of other colonial commodity producers. Quite literally, sugar companies and government officials shared the same territory – with conflicted as well as collaborative outcomes.

Moreover, there were constraints that even the most sympathetic colonial regime might alleviate, but could not eliminate. The state-industry nexus was dependent not only on the attitude and policies of the various agencies of the state's bureaucracy, but also on the extent to which developments in the political economy of rural Java empowered the state to act. Consequently, colonial power in the localities was founded not simply on force majeure, but also on historically evolving accommodations and compromises. The state was not invariably possessed of the capacity – let alone the will – to sustain the industry's hegemony in rural Java. In so far as the industry succeeded in achieving a degree of hegemony in the countryside, it derived from a variety of factors in addition to its long-standing linkages with the Indies government. Moreover, that hegemony was rarely unchallenged.

BUSINESS AND EMPIRE: VAN DER WIJCK, VAN MUSSCHENBROEK AND THE SUGAR SYNDICATE

Jonkheer Carl Herman Aart van der Wijck (1840-1914) knew the Indies very well.[2] Indeed, he had been born there, on the island of Amboina, where his father had been the Dutch *resident*. As was commonplace for the male (and, quite often, female) offspring of the colonial elites of nineteenth-century Java, the young Van der Wijck was educated in Holland, where he had extensive family connections, before returning to the Indies at the age of twenty-three. He spent the next twenty-eight years of his life working in the emergent and increasingly formidable colonial bureaucracy that was the hallmark of the Dutch regime in the Indies from the mid-nineteenth onward. Beginning in the lowly rank of *tweede commies* (junior trainee-assistant) in the Office of the Algemeene Secretarie

[2] Fasseur 1979; Van Goor 1979; *Wijck* 1953, 1987.

(General Secretariat) in Batavia, by 1889 he had risen – rather by good fortune, it would seem, than through any special ability – to the position of vice president of the Raad van Indië (Council of the Indies), the second most powerful position in the colony after the Governor General himself. It probably did no harm to his career that one of his several younger brothers (he came from a family of twelve children) was the long serving *secretaris-generaal* at the Ministry of Colonies in The Hague. Van der Wijck retired from his official positions in 1891, but within two years he was back again in office, this time as Governor General, in which position he remained until the end of the century. Inter alia, he was a keen imperialist, pursuing with vigour the long-running war in Aceh where the Dutch advance into the northern tip of Sumatra had been stalled since the heroic days of the 1870s, when attempts to crush the erstwhile independent sultanate had run into the ground.

A keen imperialist, Van der Wijck was also a firm supporter of Big Sugar. In this context, family loyalties operated in tandem with a long association with a key figure in the industry (to whom he was also distantly related): not for nothing was the Governor General criticized in the Dutch parliament on the grounds that he 'was too much in the same camp as the manufacturers'.[3] A prime case in question was the fate of the plans for curbing the industry's access to rural resources, drawn up by the high ranking Indies official J. Mullemeister (he was a member of the Raad van Indië) after extensive investigations spanning several years at the beginning of the 1890s. Under the combined pressure of the newly formed sugar syndicate (see below) and – it may safely be presumed – of Governor General Van der Wijck, the eventual enactments were a far cry from what his report had urged.[4]

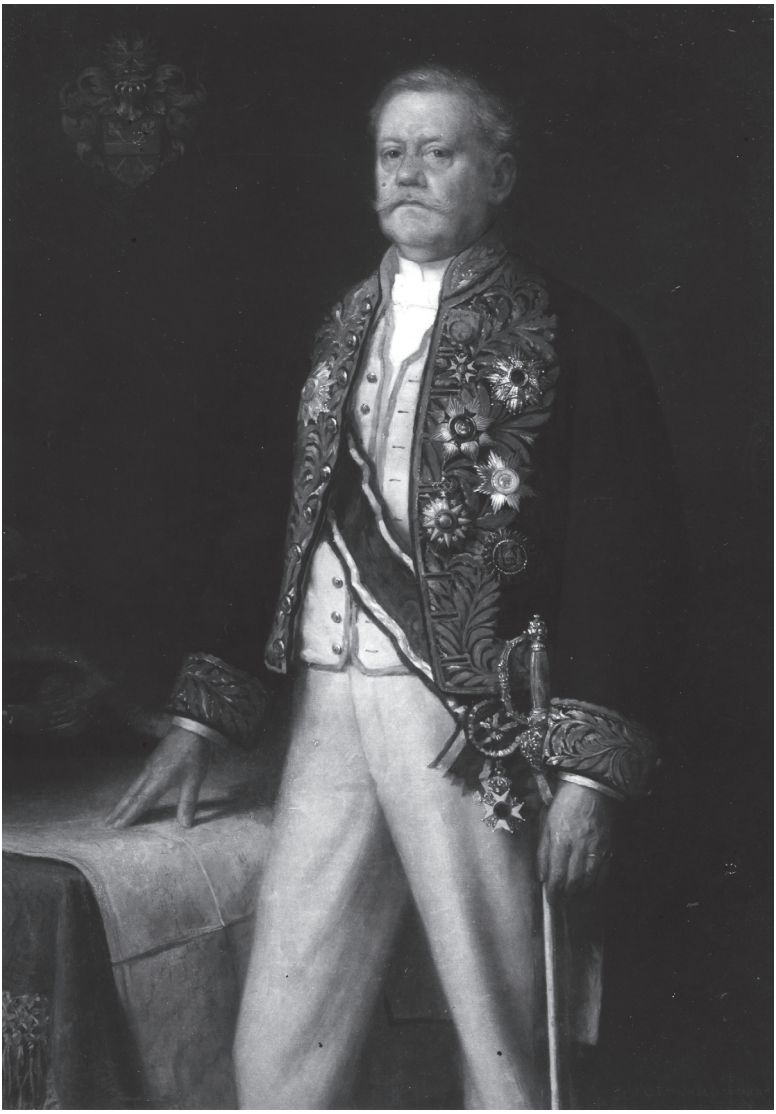
Van der Wijck was spawned by the same aristocratic Dutch families that had bought the run-down Tjomal sugar factory on the north coast of Central Java from the Indies government in the early 1870s.[5] During the 1870s they had installed as their employee, and subsequently *administrateur*, the twenty-one-year-old Samuel Cornelis van Musschenbroek.[6] His mother, Maria Teding van Berkhout (1831-1901), belonged to one

3 Fasseur 1979.

4 For a brief account of the affair (which contains no surmise, however, about the role of the Governor General), see Elson 1984:161-3.

5 *Wijck* 1953, 1987; C. Schmidt 1986:154-5.

6 S.C. van Musschenbroek, born Olst (the Netherlands) 30-12-1857, died Amsterdam 9-12-1914. He married Maria von Balluseck (1864-1946) in Pekalongan in 1885. *Nederlands Patriciaat* 11 (1920), p. 155.



A firm supporter of Big Sugar: Governor General Van der Wijck (KITLV 4653)

the families that owned the factory. Although Van Musschenbroek was of metropolitan birth and upbringing, his own family – a patrician one from Olst in the eastern part of the Netherlands – was no stranger to the Indies. The young man's uncle, C.J.W. van Musschenbroek, had preceded him there by several decades and pursued a successful, if hardly spectacular, career in the state bureaucracy, ending up as *resident* in Menado, on the island of Sulawesi (1875-1876). Perhaps wisely, after he and his family had narrowly escaped assassination there, he retired to the Netherlands and settled in the university town of Leiden, where interpersonal violence was generally presumed to be of a more intellectual kind.[7]

His young nephew, meanwhile, cemented his ties in the colonial elites by marrying the Indies-born Maria Christine von Balluseck, daughter of a high-ranking German officer in the Koninklijk Nederlands-Indisch Leger (KNIL, Royal Netherlands Indies Army). Indeed, in his choice of marriage partner, Van Musschenbroek had located himself firmly within what has aptly been described as 'the Old Indies world', in which wealth and status, rather than 'race' or colour, were the key determinants of 'being Dutch in the Indies'.[8] His newly acquired mother-in-law, Maria von Balluseck (1843-1908), was herself the daughter of (in the parlance of the day) the 'native woman Biba', the offspring of whose cohabitation with the high-ranking Indies civil servant D.W.J.C. van Lijnden in Java in the 1840s had been legitimated in accordance with Indies law and custom.[9]

Van Musschenbroek's career was based, nonetheless, not only on whom he knew but on *what* he knew. Prior to his marriage, he had travelled back to Europe and undergone training in the beet sugar industry of Imperial Germany. But technical knowledge was only part of it. While there, he also grasped the importance of the way in which the sugar industry had organized itself as a powerful business lobby within the Wilhelmine state. What he learnt in Germany, he put into practice in Java. Returning to the Indies early in the 1880s, he rapidly made a name for himself as the colony's leading 'sugar-man', and was instrumental

7 *Musschenbroek* 1914.

8 Bosma and Raben 2008.

9 Christiaans 1997. Dirk W.J.C. van Lijnden (1813-1852), scion of a prominent Dutch aristocratic family, ended his career in the Indies as a member of the Raad van Justitie at Batavia and subsequently as resident of Timor (*Lijnden* 1927).

Van Musschenbroek en famille after his return to the Netherlands, circa 1906 (Private collection)

in the setting up of the industry's research stations. Most important of all, Van Musschenbroek spearheaded the formation of the Algemeen Syndicaat van Suikerfabrikanten in Nederlandsch-Indië (Syndicate of Java Sugar Manufacturers; hereafter 'syndicate' or 'sugar syndicate').[10]

This latter was far from plain sailing. Indeed, as far as sugar capital was concerned, there were considerable difficulties in the way of taking collective action of any kind during the closing decades of the nineteenth century. Sources from the late 1880s, for example, point to fundamental disagreements, even about matters as important as wage fixing. Rival manufacturers simply did not trust each other.[11] Despite earlier, local associations, the syndicate itself did not have a formal existence until 1895. A parallel organization in the Netherlands, the Bond van Eigenaren van Nederlandsch-Indische Suikerondernemingen (BENISO, Union of

[10] For the information on Van Musschenbroek in this and subsequent paragraphs, see Wichers Hoeth 1929:176-85; 'Samuel Cornelis van Musschenbroek', Archief voor de Suikerindustrie, Jubileumnumer 1893-1918, Mei 1918.

[11] S. Everts to Factorij Batavia, 9-11-1886, in: NA, NHM, 2.20.01, inv. nr. 7936.

the Owners of Sugar Enterprises in the Netherlands Indies), only arrived on the scene as late as 1917 – and then only when wartime conditions had caused the industry particular difficulties.

Van Musschenbroek's achievement, then, may be judged to have been a substantial one – as might be expected, perhaps, from somebody who, by all accounts, developed over the years into a dynamic, not to say lordly, figure. One contemporary, referring to another of Van Musschenbroek's multiple roles in the Indies at the turn of the century, this time as superintendant of the NHM's West Java sugar factories, alluded to his habit of inspecting his domains 'with all the harshness of a reigning monarch'. Fully in accord with this, Van Musschenbroek lived in grand 'Indies' style in the *administrateur*'s mansion next to his own factory at Tjomal. This 'Indies' style, however, did not preclude a series of almost annual return visits to Europe, where (as we shall see) he evidently took good care to nurture his connections in metropolitan business circles.

There can be no doubt that Van Musschenbroek left a lasting impression on the Java industry. Even so, the syndicate, which he did so much to bring into existence, was initially a loose-knit organization. With Van der Wijck in the palace at Buitenzorg, it hardly needed to be otherwise. One important figure – the far from loose-knit lawyer J.W. Ramaer (1856-1932) – fondly recollected its early informality, when committee meetings were held on the verandah of his house in Surabaya – and the organization itself had been founded at a gathering in the same city's Simpang Club, the favoured watering-spot of colonial planters and businessmen alike. Early in the twentieth century, however, with a less than totally sympathetic regime in charge of the colony, matters became more serious. Ramaer became the syndicate's permanent representative in The Hague – and its chief legal authority and indefatigable apologist.[12] From a professional family in Gelderland, he had studied in Leiden at the Netherlands' most prestigious Law School before 'going out' to the Indies in the mid-1880s. Work with a law firm in Surabaya, Big Sugar's Java stronghold, quickly brought him into contact with the industry.

[12] For the information in this and the following paragraph, see *Ramaer* 1926; *Huldebetoon Ramaer* 1926; *Obituary Ramaer* 1932. His father was Nicholas Ramaer (one of the founders of the Nederlandsche Vereeniging voor Psychiatrie en Neurologie) and his elder brother, J.C. Ramaer, was *inspecteur-generaal van den waterstaat*. He studied at the gymnasium at Zutphen and subsequently took law at Leiden, where he graduated in 1880.

Thereafter his rise was rapid. Before long he got on the board of a locally based sugar company, subsequently took over as its CEO and retained a financial stake in the industry for the rest of his life. Early in the new century he took leave in Europe, no doubt to consolidate his connections in the metropolis as well as to reinforce his own personal status as a *totok* – one of the minority among the Dutch in the Indies who were both born overseas and looked on the colony as merely a temporary place of work and residence.

Big Sugar most sophisticated advocate: J.W. Ramaer (*Ramaer* 1926:983)

Returning from Europe in 1903, he became chairman of the Surabaya branch of the sugar syndicate, and acting chair of the Java-wide organization during the frequent absences overseas of S.C. van Musschenbroek, the syndicate's formidable founder. Ramaer repatriated in 1906 after twenty-two years in Java, but he continued his long association with the syndicate as its permanent representative in the Netherlands. As his family and educational background would suggest, he was no coarse

backwoodsman. Quite the contrary: on some issues, at least, he held (or appeared to hold) rather 'advanced' views for an industry executive. It was notable, for instance, that while still based in Java in 1905, he had used his opening address to the syndicate's annual congress in Surabaya to urge his colleagues to pay greater attention to the wellbeing of their workforce, and particularly to that of the industry's growing number of Indonesian personnel. Subsequently, Ramaer often found himself at odds with industry hardliners, but the fact was that Big Sugar needed Ramaer. He was conciliatory in manner, skilled in public relations and a noted lobbyist in The Hague, where he entertained in a fine house on the Koninginnegracht. As the inaugural chair (1917-1921) of BENISO – the key metropolitan body representing the industry's owner – he evidently moved easily in the corridors of power, and made influential connections among a wide cross section of Holland's political elite. Even the liberal-minded Minister of Colonies J.C. Koningsberger was present at the celebrations for his seventieth birthday, held in 1926 in BENISO's new premises on the Laan van Meerdervoort in The Hague.[13]

At about the same time (1907) that Ramaer was installing himself in the Dutch capital, in Java itself the organization gained its first full-time chairman (*voorzitter*) in the person of G.J.P. de la Valette. As the recently retired resident of Pasuruan, where there were more sugar factories per square kilometre than anywhere else in Java, the Indies-born De la Valette fitted the bill nicely. His first-rate connections in the bureaucracy, honed by a lifetime's work as an Indies civil servant, were matched by a wide and long acquaintance with the requirements of his new position. Indeed, De la Valette had demonstrated his goodwill toward the industry some five years earlier. During a spate of cane fires in the residency, he had ordered that villagers be conscripted as cane-field guards on the basis of their putative *corvee* obligations to the state. To be sure, the initiative was stymied by the authorities in Batavia, imbued as they were with the importance of cutting down on 'forced-labour service' of this kind, but the incident had served to nail the resident's colours to the mast.[14] Despite this, he also had some claims to be a cultivated man – his wife was Trudy Couperus, sister of the great Indies novelist, much of

[13] Jacob Christiaan Koningsberger (1867-1951) had pursued a distinguished career, inter alia, as an agricultural scientist in the Indies. As Minister of Colonies (1926-1929), he was responsible for appointing the last 'progressive' Governor General, A.C.D. de Graeff (Van den Doel 2002).

[14] Elson 1984:187-8.

Civil servant turned industry lobbyist: G.J.P. de la Valette as resident of Pasuruan – and freemason – at the beginning of the twentieth century (KITLV 503063)

The literary wife with a taste for theatricals: Trudy de la Valette-Couperus, circa 1900 (KITLV 503062)

whose most famous work, *De stille kracht*, was apparently written in De la Valette's house, and the couple were celebrated for the theatrical performances they organized in the resident's mansion in Pasuruan. Unlike the rednecks among the sugar men whom he represented, he could be relied upon to be an acceptable public face for the industry in circumstances where that kind of face – in this case a very elegantly mustachioed one – was beginning to count. His standing as a Freemason may also have helped him in his new role.[15]

The syndicate had evidently begun to think strategically. At around the same time that De la Valette was appointed, another key figure from its early days (he had been the syndicate's inaugural chair), the lawyer and sugar company executive H. s'Jacob, removed himself (1903) from the sugar 'capital' of Surabaya to the seat of government in Batavia, where presumably he was better positioned to maintain key contacts in the Indies bureaucracy. If this was indeed the strategy, it paid off handsomely. Five years after becoming chairman (1913) of the Batavia Chamber of Commerce (Kamer van Koophandel), he was nominated by Governor General Van Limburg Stirum to membership of the Volksraad, the consultative 'People's Council' established in the midst of a short-lived panic that the 'red radicalism' infecting Europe at the end of the First World War might spread to the Indies. He continued as a stalwart lobbyist for the industry. Indeed, he was sufficiently close to the increasingly conservative regime in Batavia to be appointed (1928) a *commandeur* in the Order of the Netherlands Lion (Orde van de Nederlandse Leeuw) – to the second rank, that is, of the most prestigious honour that the Dutch crown could bestow.[16]

By the 1920s Van Musschenbroek's 'offspring' had evidently come a long way from the fractious beginnings of the syndicate three decades earlier. In the interim period, moreover, neither he nor Van der Wijck had been exactly idle. Given the family ties between the two, and Van Musschenbroek's role in establishing the syndicate, it can safely be assumed that they had become well acquainted with each other during their long sojourn together in Java. Back in the Netherlands early in the

[15] For (De la) Valette (born Semarang 4-7-1853, died The Hague 17-4-1922), see *Ramaer* 1926:988; Peterson 2009:15-6; Vierhout de Vries 1995; Nieuwenhuys 1982:126.

[16] See *Obituary s'Jacob* 1932. From 1889 to 1923 he was a partner in the long-established Java firms of Reijnst & Vinju and Anemaet & Co, both of them deeply involved in one aspect or another of the sugar business. The fact that he died in Batavia at the age of 77 would suggest that he did not see himself as a *totok* or expatriate.

new century, both men were to become once again associates. Indeed, for a time at least, both had houses in the town of Baarn, an agreeable *buitenplaats* for Amsterdam's patricians and aristocrats – and businessmen and their families – well removed from the summer stench and noise of the city itself, but only a short train ride away.[17]

Van der Wijck stepped down as Governor General in 1899. Not without raising a number of eyebrows among contemporaries, he had moved quickly from high office into the boardroom. His direct links into the burgeoning 'Indies' business world of the late nineteenth-century Netherlands dated from the brief hiatus in his official career immediately prior to becoming Governor General in 1893, when he had worked in both Holland and Java with the newly established inter-Indies Dutch shipping line, the Koninklijke Paketvaartmaatschappij (KPM). A the beginning of the new century, however, he made the move from shipping into oil, and rapidly found a convivial position as chairman of the board (*commissaris-president*) of the biggest of the new Dutch oil companies, the so-called 'Koninklijke': it later became (1907) part of the commercial alliance known as Royal Dutch Shell. Van der Wijck also kept up his long-standing connection with the sugar industry, notably through his position on the board of the Cultuurmaatschappij der Vorstenlanden (CMV, Principalities Agricultural Company), one of the colony's half a dozen leading sugar financiers and owners.[18]

Van Musschenbroek, meanwhile, had also returned to the Netherlands, a country which, like many of his contemporaries among the Indies bourgeoisie, he had never actually left, in so far as his years at Tjomal had been punctuated by more or less annual visits to Europe during the industry's off season.[19] Settling permanently back in Holland with his family in 1907, he shed none of the traits for which he had become famous in Java. Still scarcely fifty and clearly incapable of retiring, Van Musschenbroek in effect took over the running of the old-established Amsterdam management and finance house of Van Heekeren

17 The 'Prospectus…Poerworedjo…November 1908' (file 'Poerworedjo', in: NA, NHM, 2.20.01, inv. nr. 7968) describes Van Musschenbroek as '*wonende te Baarn*'; Van der Wijck had died there on 8 July 1914 (Fasseur 1979).

18 The CMV managed, owned or part-owned some twenty or more factories in Central and East Java. Van der Wijck was on its board from 1903 until his death in 1914 (Jaarverslag Cultuurmaatschappij der Vorstenlanden, 1903, p. 1, in: Internationaal Instituut voor Sociale Geschiedenis (IISG), Amsterdam, ZK 58574).

19 See *Ramaer* (1926:987), where Ramaer is quoted as remarking that Van Musschenbroek '*tusschen de maaltijden altijd in Europa vertoefde*'.

& Co. Very much the *tuan besar*, who looks as if he brought a great deal of Indies money into the business, he turned the old firm upside down. He rebuilt the office, introduced its startled denizens to electric lighting and the typewriter – and to the idea of tea being served at their desks in mid-afternoon – and shifted his headquarters to a prestigious mansion at 670 Keizersgracht, one the city's three 'grand canals'. Conveniently, it backed on the narrow Kerkstraat, where the company's actual office remained located at number 257 (the building is still there today). Needless to say, he also greatly expanded Van Heekeren's involvement in the Indies plantation sector.[20] In addition to all this, Van Musschenbroek was on the board of the Rotterdam-based Internatio, one of the biggest trading and plantation investment firms in the Indies, and kept up his connection with Tjomal as managing director of its metropolitan Dutch holding company, located in smart offices on the appropriately named Javastraat in The Hague (Internatio managed its affairs in the Indies). For a short while, one of the great man's cousins was the *administrateur* at Tjomal itself.

It was in cahoots with Van Musschenbroek (and in conjunction with the Van Heekeren concern) that Van der Wijck now became involved in establishing a new sugar factory in Central Java's Kedu Residency. Named, after the nearby town (some forty kilometres west of Yogyakarta), Poerworedjo. It was no small enterprise: indeed, within a decade of its establishment it had become the largest such operation in Central Java and among the half-dozen largest in the entire colony. In total, the two men and their associates succeeded in raising some 5 million guilders in equity capital for the new venture, and spent well over 3.5 million of this on building and equipping the factory.[21] Van Musschenbroek himself twice sailed back to Java to superintend its construction and the arrangements with the Indies government that were a necessary part of

[20] For Van Musschenbroek's involvement with Van Heekeren & Co, of which he became co-manager (his son, Gijsberto Felix Willem Arthur Karel van Musschenbroek, succeeded his father in the management of the firm), see Wichers Hoeth 1929:176-85. The firm of Van Heekeren also managed and/or (part) financed extensive investments in tobacco, rubber and coffee in the Indies.

[21] See Jaarverslag Suikeronderneming Poerworedjo (Kadoe), 1913 etc, in: Stadsarchief Amsterdam, Archief Handels- en Cultuurmaatschappij Van Heekeren & Co, toegangsnummer 584, inv. nr. 1166. Van Musschenbroek was the managing director (*directeur*) of the Amsterdam-based company, and Van der Wijck was chairman of the board. His fellow directors (*commissarissen*) were F.M. Delfos, Ph. von Helmert (*bankier* te Parijs), Abraham Muller, J.W. Ramaer and A.R. Schuurbeque Boeije (*directeur*, Deposito- en Administratie Bank). The company was represented in the Indies by the NHM. Muller (murdered at Sobibor in 1943) was inter alia an NHM *directeur*.

any such speculation. Its plantations quickly came to engross some 1,750 hectares of peasant farmland; its Javanese workforce numbered in the thousands at the height of seasonal activity, and by 1920 its European *personeel* (staff) counted some thirty-seven individuals (and, in many cases, their families). Neither of the company's founders, however, had long survived Poerworedjo's establishment: felled by a stroke in Amsterdam in December 1914, Van Musschenbroek had outlived his substantially older business partner by a matter of months.

'sovereign risk': pax neerlandica and de stille macht

On the face of it, at least, the sugar industry's placement in relation to the colonial state brought many advantages. What modern-day business executives are apt to refer to as 'sovereign risk' – that is, the chance that their investments might be expropriated or otherwise imperilled – was very low indeed in late colonial Java. Indeed, in so far as political stability, public order and efficient administration were threshold requirements for successful investment, they existed there in the closing decades of the nineteenth century to an enviable degree. Above all, although myopic sugar capital did not always see it that way, by the late nineteenth century Java boasted an increasingly effective colonial bureaucracy (the *stille macht* or hidden force to which the Dutch historian Wim van den Doel so tellingly refers), which created conditions in which, in general, the sugar industry might hope to flourish.[22]

Most immediately, however, it mattered that Java was a country at peace. The Java industry thereby escaped the violent upheavals – national revolution, foreign invasion, or both – at the end of the nineteenth century that seriously disrupted sugar production in Cuba and, much nearer to home, in the Philippines and Taiwan. The Pax Neerlandica was complemented and supported, moreover, by a communications and transport infrastructure that was second to none in the surrounding region. By the century's end Java had an extensive, and still expanding, network of light and heavy rail, and by 1920 the Indies boasted more than 5,000 kilometres of rail transport of one kind or another, some 90

[22] Van den Doel 1994 (non-Dutch readers should know that the title is a play on the *stille kracht*, the 'hidden force' that forms the subject of the most famous book of perhaps the best Dutch writer on colonial Java, Louis Couperus).

per cent of it located on Java. [23] It linked virtually every major sugar factory in the colony to the warehouses and wharves of Surabaya and Semarang, Java's major ports for the shipment of sugar, and greatly facilitated the industry's operations in both manufacturing and agricultural spheres. The ease of rail travel was complimented in the early twentieth century by the finest system of hard-surfaced roads in Southeast Asia. Nonetheless, the Pax Neerlandica, and the bureaucrats whose proud boast it was, had aspects that were not always to the taste of Big Sugar.

STATE-INDUSTRY ANTAGONISM: RAADSLID DE JAAGER AND THE BB

Cornelis Jacobus de Jaager (1849-1927), the 'enemy of private enterprise' whom we met at the beginning of this chapter, seemingly shared in Governor General Van der Wijck's imperial enthusiasms.[24] At least, between 1879 and 1881 he secured a transfer, as a civilian, to the military government in Aceh ('*ter beschikking der Govt. van Atjeh*', as the Dutch phrase went), and seems to have regarded service in the long-running colonial war there as a useful stepping stone to promotion in the Indies bureaucracy. Apart from a shared imperial vision of Dutch power in the Indies, however, De Jaager and the Governor General had little in common. From the middle classes rather than the aristocracy and, again unlike Van der Wijck, with no family links to the Indies, De Jaager has been born in the small provincial town of Uithoorn, some twenty kilometres to the south of Amsterdam, and his father was a medical doctor. The image of De Jaager as a *totok* – the expatriate European who was no more than a temporary sojourner in the Indies – appears confirmed by the fact that he married while on leave in the Netherlands in 1884 – no 'Indies bride' for him – and that he and his wife (she was Davina Alida Sophie Vreede from the town of Alkmaar) settled in The Hague after his final return to patria in 1908, where he lived the accepted life of a retired Indies civil servant, in a house on the Groot Hertoginnelaan in

[23] Veenendaal 2004. Extensive data on the network by the 1910s can be found in *Spoor- en tramwegen* 1921.

[24] For the information on De Jaager's life and career in this and subsequent paragraphs, see the entry in 'Stamboek', in: NA, Ministerie van Koloniën, Stamboeken Burgerlijke Ambtenaren, Serie A, 1836-1927, toegangsnummer 2.10.36.22, inv. nr. 912, folios 103, 541; personal communication Peter Christiaans, April 2011. For his place of residence, see *Adresboek* 1920.

a respectable but far from ostentatious quarter of the city. His widow, around eleven years younger than her husband, outlived him by some sixteen years, dying there in 1943, during the German occupation.

De Jaager's Java career, which had begun at the end 1872 when he sailed to the Indies for the first time, was fairly orthodox. The young man started on the lowest rank, as a *controleur* (district officer), and had progressed by 1886 to a decade-long sequence of positions as assistant resident in various parts of East Java. His career culminated in 1897 in his appointment as resident of Kediri, then still something of a frontier region astride the Brantas river, populated in part by new immigrants from the densely peopled northern littoral of Central Java. Even then, however, Kediri was home to an increasing number of sugar factories, and it was probably no accident that it was with the sugar industry that De Jaager became embroiled in the closing stages of his career in the early 1900s.

For the background to what happened, however, we probably need to look back twenty years or more, to the mid-1880s, when De Jaager served for a couple of years under the Indies government's chief inspector of sugar and rice cultivation, J.H.F. Sollewijn Gelpke (1840-1890). Among his many publications, Sollewijn Gelpke had made a comparative study of rice cultivation in Java and Italy, and was regarded as an expert on matters relating to *sawah* (rice field) irrigation and on the socio-economy of rural Java in general.[25] His 'pupil' obviously learnt his lessons well. During his tenure as resident of Kediri, De Jaager produced a report on the future prospects for large-scale 'technical irrigation' in sections of the Solo river valley where he had previously been posted. In it, he showed himself deeply sceptical of claims in industry circles that peasant farmers drew any direct financial benefit from renting their fields to the sugar factories. Indeed, he remarked that, 'sugar cultivation had a predominantly adverse effect on indigenous agriculture […] the most prosperous villages therefore are those that do not rent their land [to the sugar industry]'. He contended that the way in which the sugar industry manipulated the supply of irrigation water seriously disadvantaged peasant farmers. He denied, however, that such a critique meant that he

[25] On Sollewijn Gelpke, see, for example, Hugenholtz 2008:278-80. Commissioned to undertake a study that would form the basis for a complete overhaul of the land rent that the Indies state imposed on the peasantry of Java, Sollewijn Gelpke produced, in effect, a massive report on the '*algemeen economische toestand der bevolking*'.

was an 'opponent of private enterprise': on the contrary, he claimed to believe that the sugar industry in particular was a vital factor in the development of rural Java (*acht ik het behoud daarvan een levenskwestie voor Java*). What he did argue, on the other hand, was that Big Sugar should pay its way, specifically by bearing some of the costs of the huge irrigation works currently undertaken by the Indies government.[26] This was not an argument, of course, that would have been well received in the board rooms of Amsterdam, and might well have been enough in itself to qualify De Jaager as a bogyman as far as the industry was concerned.

But there was more – and it again related to the impact on peasant farming by the industry's demands for irrigation water. Having returned from Holland in 1904 to take up his appointment in the Raad van Indië, in the following year he re-stated his earlier position a great deal more strongly, roundly declaring (at least, so it was reported) that 'in the first, second and third place access to irrigation water was the prerogative of the peasantry'.[27] In a context in which the industry's 'right' to first-call on irrigation water for its newly planted cane had been a bone of contention between the sugar factories and sectors of the state bureaucracy for some decades, this was inflammatory stuff. It is important, nonetheless, to appreciate the true character of De Jaager's politics: he was no red radical (indeed, he would hardly have been in the Raad van Indië if he was); this was evidenced, for example, by his firm opposition, along with his fellow members of the council, to proposals that qualified. Indonesians should be admitted to the ranks of the Binnenlands Bestuur (BB, that is the elite corps of the Indies civil service).[28] The BB was an institution not to be tampered with lightly.

By the late nineteenth century, the BB so much prized by De Jaager comprised a corps of state officials organized along rigidly bureaucratic lines. Its members were not prone to being over-awed by sugar factory managers and company executives, much as they might sometimes work in cahoots with them. Residents as well as senior bureaucrats in Batavia were possessed of a long tradition of quasi- autonomous power and prestige, some of it inherited from their pre-colonial predecessors. Even

[26] De Jaager 1901; Ravesteijn 1997:157, 219.

[27] 'dat het irrigatiewater in de eerste plaats is voor de Inlandsche bevolking, dat het in de tweede plaats is voor de Inlandsche bevolking, en dat het in het derde plaats is…voor de Inlandsche bevolking'. Rapport Van Geyt, 23-10-1905, (unpaginated), in: NA, NHM, 2.20.01, inv. nr. 7938.

[28] Van den Doel 1994:191.

in the early twentieth century the more 'old-fashioned' of their number still were accompanied in public by a ceremonial umbrella bearer.[29] More generally, the trappings of office extended to splendid outward appearances upheld by a rigid sumptuary code, likewise reminiscent of their Javanese forbears.[30] In such circumstances, one cause of fraught relations between industry and bureaucracy was the personal affront experienced by state officials in the localities at what they saw as a local abrogation of prestige, power and influence. By the late nineteenth century this bureaucracy had developed interests and agendas that – though far from homogenous – were often far from congruent with those of sugar capital. In consequence, despite the best efforts of the likes of Van der Wijck and Van Musschenbroek, Java was no 'plantocracy', as manifested for example elsewhere in the region under successive Spanish and American regimes in the Philippines, in which real power was heavily vested in elites of (colonial) plantation owners and their associates and in which family connection was the key to the sinews of state power.[31]

BUREAUCRATIC INTERVENTION: THE OFFICIAL INQUIRY

Bureaucratic intervention in the sugar industry began early. The first major step in this direction came in the mid-1850s, when the Indies government established an exhaustive, three-year long investigation (the so-called Umbgrove Commission) into the industry which it had nurtured. 'Two cart loads of documents', as one caustic contemporary remarked, were quickly consigned to the archives,[32] but it was a clear signal that the Indies state intended to keep the industry firmly within its sights.[33]

As time went by, the chief issue at stake was the bureaucracy's fear that the impact of large-scale sugar production would destabilize peasant society by sapping the economic and social vitality of the petty farming households that were seen as forming the bedrock of the village world

29 Van den Doel 1994:201-3. This was despite the attempts of the central government to outlaw such 'feudal' practices.

30 Schulte Nordholt 1997.

31 See, for example, McCoy 1994.

32 For the Umbgrove Commission, see Fasseur 1977; Knight 2005.

33 Elson 1984:259-60, lists more than a dozen official reports relating to aspects of the sugar industry's interaction with the peasantry, dating from 1895 to 1917. These represented investigations other than those of the '*mindere welvaart*' inquiries discussed below.

of rural Java. With this fear in mind, from quite early on in their relationship with the sugar industry, sectors of Indies officialdom developed perspectives on the industry's access to land and water that brought them potentially into conflict with sugar factories, their managers and owners. Such perspectives were by no means universally shared within the bureaucracy. Nonetheless, few officials had much sympathy for the industry's apparent view that the conversion of large swathes of Java's rural population into something akin to a proletariat was both inevitable and probably desirable (at least, that is, until they started behaving like proletarians and took industrial action against their employers). In consequence, well schooled by their mentors in the Netherlands, from the late nineteenth century onward, government officials sought to preserve Java's peasant communities from the inroads of 'capitalism'.[34]

Protecting farmers and village communities meant, on this reading, restricting and regulating the sugar industry's access to land and to the irrigation water that gave it value. As we have seen, it was the latter that lay at the heart of De Jaager's reservations about the industry's operations. But there were many more mundane issues of contention between state officials and Big Sugar. By no means the least of them related to the prevalence of cane fires. Cane fires, particularly common in the Java industry during the 1910s, played havoc with the campaign schedule and – rather frequently – resulted in significant sugar loss. Van Musschenbroek and Van der Wijck's newly established Poerworedjo factory in Central Java, for instance, was no more immune from such events than any of its counterparts, so that when a steep decline in fires was recorded during the 1917 campaign, the manager was at pains to attempt to explain why. The first two his explanations were standard: one was improved security in the cane fields ('*verbeterde controle op de bewaking der riettuinen*') and the other alluded to the increased capacity of his factory's grinding machinery, which resulted in a shorter campaign and hence reduced the likelihood that farmers would fire the cane in an attempt to speed up the return of the rented fields. His third explanation, however, alluded to something else: the antagonism that might well exist between the sugar factories and the local-level officials of the Indies government, for he contended that cane fires had also decreased dramatically since

34 For an extended discussion of this and related points, see Breman 1983; Knight and Van Schaik 2001.

the departure of the Dutch *controleur* Van Leeuwen, who had a purportedly hostile stance to the industry.[35]

Yet, more was involved than the strictures of one high-ranking bureaucrat in the final stages of a long official career, or the angst of a young *controleur* at the beginning of his. The larger framework was that of the so-called Ethical Policy (*Ethische Politiek*). Difficult to pin down with any precision or consistency – the policy was a very broad church indeed – the resultant 'ethical trend' saw the coming into circulation in government circles in The Hague and among colonial administrators in the Indies, albeit in a heterogeneous and ambiguous fashion, of ideas that placed a premium on the state's role in promoting the betterment of 'the native'. Inter alia, it proposed that profit taking should be tempered by a degree of responsibility for the development of the native people's of the Indies. Politically, it found some oddly assorted bedfellows in the Netherlands, on the 'anti-revolutionary' right and socialist left, and was accordingly perhaps an altogether more nebulous concept that has sometimes been imagined.[36] Be that as it may, it was widely thought within the industry that the resultant bureaucratic climate in Batavia (and The Hague) was such that officials looking for advancement were, per se, likely to be hostile to sugar capital.

The inquiry into 'diminished welfare' and the Suiker Enquête, circa 1900-1920

The upshot was that for the better part of two decades the fraught relations between the colonial state and Big Sugar were articulated through a series of official investigations that drew on a long tradition – given a new legitimization by the 'ethical trend' – of attempts to bring the industry firmly within the orbit of the bureaucracy. Within industry circles (though perhaps mistakenly) the most threatening of these investigations was considered to be the so-called *Onderzoek naar de mindere welvaart* (Inquiry into diminished welfare).[37] The investigation did not

35 See Jaarverslag Poerworedjo 1917, p. 4, in: Stadsarchief Amsterdam, Archief Van Heekeren & Co, no. 1167.

36 For a recent, dispassionate summary, see Van den Doel 1994:165-76.

37 For a succinct introduction, see Hüsken 1994:213-7. The verb *minderen* has two connected meanings in Dutch: diminish or decline. Despite the title given to his essay, *Hüsken* (1994:216) appears to have opted for 'diminished' welfare as the rendering that best conveys the situation into which investigators were inquiring.

have the sugar industry uniquely in its sights. Indeed, its overall purpose, in line with the proclivities of ethically minded bureaucrats, 'was to provide a broad analysis of the stagnating rural economy and the structural weaknesses that were held responsible for the disastrous effects of the periodic famines of the preceding decades'.[38] Nonetheless, it was widely viewed by Big Sugar as so potentially damaging to their interests, especially in relation to their multifarious (not to say, nefarious) arrangements for renting peasant farmland, that several counter-factual investigations were launched by the syndicate.[39] In the event, the 'Diminished Welfare' investigation (and extensive subsequent publication of its findings) turned out to be a drawn-out – and finally inconclusive – affair from which the industry had little to fear. Its report, as one contemporary noted, 'was "a stew-pot of surmise" from which everyone could choose morsels to his taste'.[40]

Notionally at least, a further investigation, specifically focused on the industry's exploitation of rural resources, had a much greater potential to cause problems for sugar capital.[41] This was the investigation done by the Suiker-Enquête Commissie (Sugar Inquiry Commission) which was instituted in 1918 and which reported three years later.[42] Toward the end of the First World War, a major problem for the government was criticism of the sugar industry voiced in the newly created Volksraad. At the same time, it was placed in a position of having to defend a policy of allowing the sugar industry to continue with the rental of large areas of high-quality farmland, thereby diverting resources away from rice production despite an apparent threat of starvation in the countryside.

An official inquiry, with both state officials and sugar-men on board, offered a possible way out from what had become an awkward situation for both industry and bureaucracy. But it threatened to be rather more than that. Tjokroaminoto, the leading figure in the nationalist movement – and head of the Sarekat Islam (Islamic Union), which had been highly critical of the industry in the past – was also appointed to the commissie, while its initial chair was none other than G.Th. Stibbe, a *resident* who

38 Hüsken 1994:216.

39 Hüsken 2001.

40 Hüsken 1994:216.

41 A further, much more localized and specific inquiry into industry land-rental practices, the so-called *braakhuur*, or fallow-hire, system is discussed extensively in Knight and Van Schaik 2001.

42 For the information and documentation in this and the following paragraph, see Knight and Van Schaik 2001.

had long been viewed in sugar industry circles as hostile to their interests. It looked as if it might turn into the culmination of a decades-long project in (some) official circles in the Indies to curb the industry's hold over Java's agrarian resources.

In reality, however, the investigation was to be a turning point of a very different kind. As we shall see in a subsequent chapter, the period from 1918 to 1920 showed an unprecedented level of industrial and agrarian unrest within the sugar industry, which put the sugar companies more overtly on the offensive than had ever been the case before. Even while the Suiker-Enquête Commissie was convening, the sugar owners' organizations, both in the Indies and in the Netherlands, positioned themselves to take a hard line against what they characterized as the 'incitement' (*opstokerij*) affecting their industry. In a meeting at the Ministry of Colonies in The Hague in March 1920, industry representatives evidently brought pressure to bear on those officials who had attempted to focus the discussion on the impoverished state of rural Java, low wages and the need to ameliorate local condition. For lobbyists such as this, the problem was not one of defusing unrest, but of suppressing it. The threat of 'Communism' was much bandied around; 'native' labour organizations were depicted as either revolutionary in intent or, at best, 'political' in purpose.

Resident Stibbe, meanwhile, returned to the Netherlands, his place as chair of the enquête taken by a less hostile official, while Tjokroaminoto, from whom much had been hoped, was distracted by a crisis between Sarekat Islam and the Indies government, and took no real part in its investigations. Hardly surprisingly, given the rapidly changing circumstances in which it had taken place, the outcome of the enquête was a public and widely circulated report that rebutted most of the charges levelled against the industry. Industry sources evidently regarded it, somewhat smugly, as a complete vindication: for the NHM, at that time owner or financier of more factories than any other of the colony's 'sugar' companies (and with its widespread banking and commercial interests, very much more than that) it represented 'a glorious refutation of many accusations against the sugar industry'.

THE INDUSTRY GAINS GROUND

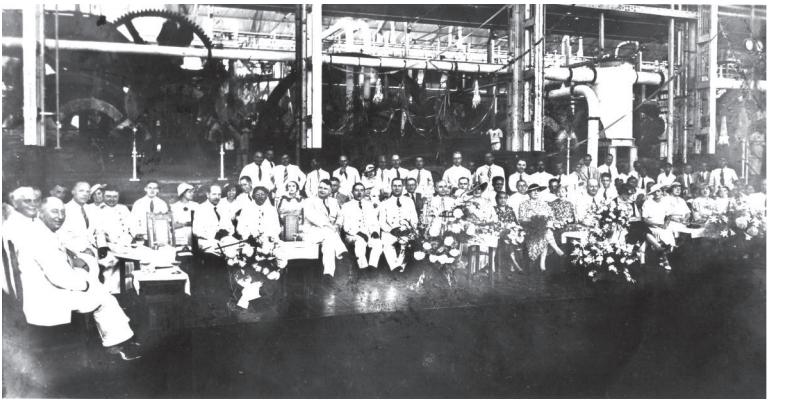
At the beginning of the 1920s, the prevailing climate of opinion in Indies government circles was changing, even radically, in the industry's favour. A new generation of state officials – and a new Governor General and colonial minister – was notably more sympathetic to the industry's interests than their immediate predecessors. The Ethical Policy went out of fashion, though the fact that the Indies state was a far from homogenous entity meant that there was nothing like unanimity on the score. Nonetheless, a new direction was palpable. One sign was the extent to which unrest among the industry's labour force, manifested in strikes and other disputes at various time between 1920 and 1924, came increasingly to be associated with dangerous political radicalism in the official mind – all the more so after failed 'communist' uprisings and would-be uprisings in 1926-1927.[43] Thereafter, the Netherlands Indies began to evolve in a 'corporate' direction, characterized, as one scholar has remarked, by the 'mutual embrace of business and government', that for all its continuing problematic character would have been inconceivable in the 1900s and 1910s.[44] This was not 'plantocracy' but something altogether more complex, involving (as far as the sugar industry was concerned) a gathering constellation of interests that was to see the industry through both the 1930s as well as the turbulent decades that were to follow.

The newly honed 'embrace' of state and industry was nowhere more palpably in display than at the ceremonial re-opening of the NHM's huge Nieuw Tersana sugar factory in West Java in 1936. Since the onset of the interwar depression and the consequent near collapse of Big Sugar earlier in the decade, much had happened. The newly corporate nature of the nexus between industry and state had its first public outing in 1932, with the establishment of a single seller organization for the industry, run by a combination of government officials, bankers and industry executives. Over the following three years, the Nederlandsch-Indische Vereeniging voor de Afzet van Suiker (NIVAS, Netherlands

43 For developments within the Indies state during the interwar decades, see Van den Doel 1994:373-442, 1996; Cribb 1994.

44 The very notion of a 'corporatist' or 'corporate' state remains, of course, problematic, not least because it tends to occlude the dynamics of the relationship between the parties concerned. See, for example, McVey 1992:13-4.

Indies Association for the Sale of Sugar)[45] was able to dispose of most of the huge stockpile of sugar – around 3 million MT or more – under the weight of which Java threatened to capsize. Yet, it did far more than that, since NIVAS was also mandated to set annual production quotas for the industry as a whole, and formed the crucial agency in the corporate state's determination to set Java sugar 'back on its feet'.



The corporate state at work: Ceremonial re-opening of the NHM's Nieuw-Tersana sugar factory, 1936

Nieuw Tersana's ceremonial re-opening was hence a celebration of some significance. It was both a triumph for the NHM and, at the same time, a signal that the industry as a whole was showing marked signs of revival – and that this revival was predicated, in part at least, on an unprecedented streamlining of operations. But it was rather more than that. The guest list for the event was a roll call of representatives of the emergent corporate state. The guests at the re-opening were assembled in front of the camera – probably operated by a Japanese photographer (such people had established a ubiquitous presence in the Indies during the 1930s) against a background of festively decorated machinery. They

45 Taselaar (1998:151-6) gives a detailed account. See also Boomgaard 1988:162-3; H. Prinsen Geerligs and R. Prinsen Geerligs 1938:80-1. For a resumé of the 1932 regulations (and their reiteration *in perpetuum*) in 1936, see http://www.kitlv.nl/documents/library/Metamorfoze/Indisch%20Verslag/MMKITLV01_PDF_TS2710_1935.pdf, p. 45; http://www.kitlv.nl/documents/library/Metamorfoze/Indisch%20Verslag/MMKITLV01_PDF_TS2710_1936.pdf, pp. 53-4.

included a delegate of the governor of West Java; the latter's immediate subordinate, the resident of Cirebon, W.A. van der Capellen and his wife (the husband was a descendant of an early nineteenth-century Governor General); the highest-ranking Indonesian official in the area, the *regent* or *bupati* of Cirebon, Raden Adipati Ario Soeriadi and his 'official' wife, the Raden Ajoe (the two ladies are seated next to each other, holding bouquets). The guests of honour were supported by a cast of lesser dignitaries and company staff, including (to judge by their headgear) a further sprinkling of Indonesians. (Indeed, all that was missing from the line-up were the military officers – and their Indonesian-Chinese business partners – under whose control factories like Nieuw Tersana came when the industry was nationalized in 1957-1959. But that belongs to a later and different story.)

Even given these significant shifts in the dynamics of the nexus between the Indies state and sugar capital in the closing decades of Dutch rule, however, the longer-term picture remains one of an industry locked in step – often somewhat uneasily – with an 'autonomous' bureaucracy. In global terms, this position was sufficiently anomalous (perhaps only the Japanese sugar industry in Formosa approached it in this respect) as to form a key dimension of a history of difference that characterized Java sugar capital and underscored its unique position in the age of mass production. Java's singular location in the international sugar economy was also manifested, however, in the industry's mode of finance. In turn, this singularity both helps explain Java sugar's longevity – the industry survived the crash of the world sugar market in the 1930s in circumstances where it might have been expected to fold completely instead of staging a substantial revival – and also points to its limitations as a major world producer. It is to an analysis of this situation that we can now turn.

Chapter 4

No business like sugar business

From profit to investment

Java's late colonial sugar industry developed primarily (and eventually almost exclusively) as a supplier of the commodity to other Asian markets. In turn, this development was predicated on the evolution of a unique agro-industry in the cane field – but one that, over time, fed into a complex and sometimes fraught nexus between Big Sugar and the colonial state. Nonetheless, any suggestion of 'sovereign risk' attendant on investment in Java sugar was marginal as an explanation of the financial strategies pursued by the Java sugar companies from the 1880s onward. Basically, those strategies were driven by other factors, related primarily to an apparent determination strictly to limit recourse to financial markets in the Netherlands (or anywhere else), and consequently to finance expansion as far as possible from reinvested profits. Even in the particular context of western enterprise in the late colonial Indies, this was a singular strategy that amply merits the designation of 'no business (quite) like sugar business'.

The international sugar economy in crisis: 1884 and its aftermath in Java

The story begins in the 1880s, when Java's hitherto largely self-reliant sugar producers suddenly found themselves in deep financial trouble. During the course of 1884, the sudden development of what would now be called a 'bear market' hit the international sugar economy. Precipitated by a crisis in overproduction – itself a consequence of the struggle for hegemony in world markets between cane and beet sugar – and by stagnating demand, it saw the industrially manufactured form of

the commodity ('centrifugal' sugar) loose between one third and one half of its value in the course of a few months.[1]

The drastic fall in sugar prices had mixed results for the Java producers. The long-term upside (as we saw in a previous chapter) was that it opened up a potentially vast market elsewhere in Asia for 'cheap' industrially manufactured sugar. The immediate downside, however, was that it meant that producers and their financiers were faced with bankruptcy. By 1885, several locally based firms with a big stake in the industry had gone bankrupt, while others teetered on the verge of collapse, leading to a situation in which many of the colony's sugar factories came increasingly into the orbit of Netherlands-based financiers. Under their aegis, metropolitan capital played an important role in resurrecting and expanding a wide variety of plantation enterprises, sugar included. Thanks, in part at least, to a substantial reconstruction on the basis of which the industry was capitalized, Java sugar survived the crisis. Nonetheless, this reconstruction was more complex than has sometimes been appreciated. It certainly involved considerable injections of metropolitan capital, together with a major reinforcement of metropolitan control. On the other hand, it did not guarantee a continued flow of such capital once the immediate crisis was over.

THE 'INDIES BUSINESS COMMUNITY': METROPOLITAN CAPITALISTS AND COLONIAL BOURGEOISIE

From the late nineteenth century onward, the ownership and management of Java sugar came to form an integral part of what its foremost historian, Arjen Taselaar, has described as an 'Indies business community' or '*het Indische bedrijfsleven*', based in the Netherlands itself. Its leading figures were prominent among a 'core elite' of merchants, bankers and investors, located predominately (though not exclusively) in Amsterdam. Their interests, in addition to sugar, included a variety of other plantation crops, oil and mining, and shipping and finance. The sugar industry as a whole participated, that is to say, in an interlocking network of direc-

[1] The most richly detailed, modern account of the crisis of 1884 and its aftermath is (on which I gratefully draw in what follows) is to be found in Claver 2006:109-48. See also Korthals Altes 2004:118-30; De Bree 1928-30, II:232-58.

torships and board memberships that embraced all these spheres – and extended into the heart of Dutch metropolitan business.[2]

'*Meneer* S.P.': The leading Amsterdam business man and key figure in the 'Indies business community', S.P. van Eeghen (1853-1934) (Rogge 1949: opposite p. 368)

An outstanding case was that of S.P. van Eeghen (1853-1934), scion of a leading Amsterdam merchant family whose roots went back to the seventeenth century.[3] He was one of the founders of the Cultuurmaatschappij der Vorstenlanden (CMV, Agricultural Company of the Principalities), the *cultuurbank* established in Holland in 1888 to re-finance the agricultural speculations in Central Java of the collapsed, Java-based firm of Doorepaal & Co. As well as being the long-serving *commissaris-president*, however, Van Eeghen, universally known in his native Amsterdam as '*Meneer* S.P.', had also been at one time or another chairman of the board of the NHM and two major shipping firms, as well as a board member of the Nederlandsche Bank and the Amsterdamsche Bank. Not surprisingly, given these multiple directorships, from 1904 to 1920 he was also chairman of the Amsterdam chamber of commerce. At the heart of his extensive business interests, however, was the family firm of Van Eeghen & Co, long established on Amsterdam's Heerengracht.

Van Eeghen stood out in terms of his sheer ubiquity: indeed, it was said that he and his brother-in-law, W.H. van Loon, held the lead

2 Taselaar 1998:31-98. Similar conclusions for an earlier period are outlined in Kuitenbrouwer and Schijf 1998.

3 For a short biography, see Van Horn 1989.

strings of the Amsterdam financial and business world ('*de touwtjes van het Amsterdamse financiële en zakenleven in handen hielden*'). Yet, '*Meneer* S.P.' and his associates' commanding presence in the 'Indies business community' was also symptomatic of a wider trend that had begun before the sugar crisis of 1884 and was to extend long after it. This was the degree of interconnectedness, even fusion, between a notionally 'colonial' bourgeoisie and its metropolitan counterpart. In turn, this was in part the outcome of the multi-generational existence of 'empire families' with deep roots in both colony and metropolis. Though Van Eeghen himself apparently had no family ties with Java, his firm most certainly did: from the mid-nineteenth century onward, its extensive trade with the colony included a long-standing relationship with one of Java's major sugar exporters, the Batavia firm of Maclaine Watson & Co, and their business associates in Semarang and Surabaya.[4]

In the wake of the crisis of 1884, connections such as these – both personal and commercial – were to have two major implications for the sugar industry with respect to its financing, ownership and management. The first was that the people in the Netherlands who stepped in to refinance the industry after 1884 were far from being strangers to it: on the contrary, their association with it was a long one. The young S.P. van Eeghen himself had spent a year or more in the Indies (before returning to Holland in 1877) and his experience was a common one among his late nineteenth-century contemporaries in the 'Indies business community'. The second implication was that the industry's history after 1884 was not one of sweeping away or submerging the 'colonial' bourgeoisie and their affiliates, who had been the driving force behind Java sugar in the preceding decades. Rather, it was a history of their continuing presence. New men and new money were only part of a story characterized by a greater degree of continuity than has sometimes been recognized. This fact exerted a vital influence in sustaining the industry through the crisis of the mid-1880s, and on the re-financing of the entire enterprise that took place in its wake. Conversely, it also more or less guaranteed that the industry would remain in the hands of a (largely) closed circle of investors and owners, something which was to have important consequences for the industry's subsequent financing.

4 Taselaar 1998:77; Rogge 1949:197.

RE-FINANCING JAVA SUGAR FOR THE AGE OF MASS PRODUCTION

The age of mass production saw the (re-)emergence of two major cane sugar exporters in the world market: Cuba and Indonesia. There were substantial and significant differences between them, however, in the way in which the expansion of production was financed. Cuba at the beginning of the twentieth century was just emerging from a decade of civil war, foreign invasion and 'pacification' at the hands of the United States that had massively disrupted sugar production. Thereafter, United States' capital invested in Cuba – an estimated 60 per cent of which went to the sugar industry in the form of loans – in 1906 already amounted to 200 million US dollars, and had reached one billion dollars by 1927.[5]

Java experienced nothing like this. At the end of the 1920s, the notional capital value of the entire Java sugar industry was reckoned to amount to around 800 million guilders (approximately 320 million dollars at 1929 values), less than one-third of that invested in Cuba by American financiers.[6] Moreover, the sheer quantity of capital involved was only one aspect of the contrast; finance of expanding production in Java also took place on quite different lines than in Cuba. To be sure, despite the post-1900 surge of American investment, a certain amount of Creole Cuban-Spanish capital and entrepreneurship persisted on the Caribbean island.[7] Nonetheless, it was overseas banks and their shareholders that provided the bulk of the finance available to the Cuba industry. In Java, however, the industry's situation vis-à-vis overseas capital was altogether more complex.

5 Pollitt 1984:7-9. In 1913, United States' capital owned 39 major sugar factories in Cuba and controlled 37% of total sugar production. By 1924 they accounted for 60% of the total and owned 74 factories (Ayala 1999:95).

6 Figure calculated on the basis of $US 1 = 2.5 guilders. Estimates for Java for 1929 are taken from Keller 1940:13-4. Keller's estimates are quoted in Callis 1942:26-8.

7 Speck (2005) has advanced the important argument that in the early stages of the reconstruction of the Cuba industry after the war of independence, 'Creole' Cuban-Spanish capital and entrepreneurship played a significant role, and that hence 1898 was less of a watershed than has sometimes been supposed. The parallels with the argument about the Java industry advanced in the following paragraphs are obvious enough to need no further elaboration.

CHANGE AND CONTINUITY AFTER 1884

Developments in the Java industry during the last two decades of the nineteenth century took place on the basis of the increasingly concentrated character of sugar capital. 'Big Sugar' came into its own as six major companies came to dominate the industry. They were: the Handelsvereeniging Amsterdam (HVA, Trading Association Amsterdam); the Koloniale Bank (KB); the big Rotterdam-based trading and investment combine known as Internatio; the Nederlandsch-Indische Landbouw-Maatschappij (NILM, Netherlands Indies Agricultural Company); the CMV; and the ubiquitous NHM. The first five were designated as *cultuurbanken*, or agricultural investment banks, and were based in Amsterdam or Rotterdam,[8] while the sixth, the NHM, was the colony's biggest commercial enterprise, founded in the Netherlands as far back as 1824 and heavily engaged in banking and agricultural enterprise, particularly sugar.

Nonetheless, the concentration of capital was by no means complete, nor did it imply a complete makeover of the industry by new capital, either financially, in terms of personnel or in respect to the industry's business culture. A colonial bourgeoisie of merchants, factory owners and financiers, embedded in the industry since the middle decades of the century, continued to play a significant part in its history. This was also the case, of course, in places as far apart as the Philippines (very notably) and Cuba. But the colonial bourgeoisie of the Netherlands Indies, primarily located in Java, was a distinctive one, in so far as constantly renewed links with Holland were a vital element in its composition – and had been so for generations. This nexus was not disturbed, as was the case in Cuba and the Philippines, by a change of (quasi-)metropolis – from Spain to the USA – occasioned by civil war and foreign invasion at the close of the nineteenth century.

There was no such break in continuity in the case of Java, nor did the sugar crisis of 1884 herald one. It certainly changed the dynamics of the relationship between the sugar interest in Java and metropolitan Holland. On the other hand, late nineteenth- and early twentieth-century developments did not eradicate the very specific 'Indies' character

[8] For a contemporary account of the *cultuurbanken*, see Helfferich 1914. The authoritative modern discussion is to be found in Taselaar 1998, especially Chapter 2. Taselaar lists the NHM among the *cultuurbanken*, on the convincing grounds of its huge investment in sugar and other 'plantation' commodities.

of sugar capital in Java. Continuity was fostered, moreover, by the fact that none of the *cultuurbanken* were themselves exactly newcomers to Java or to its sugar industry. All of them (or their antecedent businesses) had been active in the colony prior to the crisis of 1884. Uniquely, the NHM had been a direct investor in production since as far back as the

One of colonial Indonesia's leading *cultuurbanken*: The Amsterdam head office of the HVA, circa 1929 (*Aangeboden door HVA* 1929)

1840s,[9] and individuals like Hendrik Reineke, co-founder of the HVA, and Jan Hudig, founder of the Koloniale Bank, had spent their early business careers and a decade or more of their lives as part of the colonial bourgeoisie.[10] It was on their initiative – the initiative, that is to say, of people already heavily involved in the business world of the Indies – that investment and management companies were set up in Holland to exploit the Indies connection. Hence when, in the immediate aftermath of the sugar crisis, these firms and others like them began to absorb previously autonomous enterprises, either through amalgamation or, perhaps more commonly, through the establishment of discrete, limited liability companies (*naamlooze vennootschappen*), they did so on the basis of existing interests in the colony.[11] The upshot rendered the post-1884 reconstruction of the industry rather less of a watershed than has sometimes been supposed.

Prior to the crisis of 1884, the Java industry had been able to finance the expansion of production, and much of the ongoing technological innovation in manufacture that was central to it, by drawing to a considerable extent on its own resources. After 1884, the massive reduction in profit margins, consequent on plummeting prices in world sugar markets, changed all this. It certainly meant that in the short term (the qualification is a vital one) there could be no question of future investment – or, indeed, survival – without recourse to metropolitan capital. In these potentially dire circumstances, the existing close identity between colonial and metropolitan bourgeoisie became an important conduit for channeling metropolitan capital into a cash-strapped industry. It was enabled, thereby, to both ride the crisis and to take advantage of the opportunities for further growth offered by the dawning age of mass markets in Asia itself. As far as the colonial bourgeoisie were concerned,

9 Ranked in order of early twentieth-century size of their operations, the companies concerned were the NHM (founded 1824); the HVA (from 1879); the NILM (its origins in the investments of the NI Handelsbank dated from the 1860s); the CMV (origins pre-1884 in the operations over more than two decades of the Semarang firm of Dorrepaal); the Koloniale Bank (from 1881); and Internatio (again from the 1860s). Prior to the crisis of 1884 and the subsequent restructuring, moreover, both the KB and the Handelsbank had been heavily involved in financing Dorrepaal & Co's extensive sugar investments in Central Java, thereby further accentuating the continuities pre- and post-1884 and the long-term links between 'metropolitan' firms and 'colonial' enterprises that underpinned the post-1884 restructuring. For Dorrepaal, see Claver 2006:130-44; Bosma and Raben 2008:119-23, 259-63.

10 For Hudig, see Claver 2006:105-9. Hudig arrived in Java in 1864 and left (after several short intermissions) in 1880. He returned to the colony in April 1884.

11 For a detailed discussion of these and allied developments, see in particular À Campo 1996; Sluyterman 2005:41.

many found themselves integrated into the new structures of ownership and management, either as the owners of continuing, family-run businesses or else as executives within the large companies that had come to the fore at the end of the nineteenth century.[12] Indeed, without their expertise, experience and connections the late nineteenth-century makeover of the industry would scarcely have been feasible. They actively participated, that is to say, in the merger of bourgeois interests in a common colonial venture.

Within this context, familial proprietorship and the family firm did not disappear from the industry, any more than did the manager who was a blood relation of the owners. Instead, family firms tended to take skilled professionals onto their boards, and consanguinity was increasingly complemented by experiential and theoretical training. A case in point was the seasoned industry professional, Steven Everts. Born in Deventer in the eastern part of the Netherlands in 1847, Everts was a man who was as much 'of the Indies' as he was a metropolitan Dutchman: he spent the greater part of his adult life in the colony. Retiring to Holland in the mid-1890s, he did so in the company of his Java-born wife and their Java-born children, and settled in Hilversum, a town (its sandy soil was said to be good for many 'colonial' ailments) in which he could be sure of the company of others with similar life experiences. Evidently, he and his wife, Henriette Caroline de Vogel, were cultivated people: Everts was at one time a shareholder in the newly built concert hall (Concertgebouw NV) in his adopted city, which staged, inter alia, symphony concerts and even opera.[13]

Everts had entered the employment of the NHM in Java sometime in the 1870s. He evidently had some technical training and experience, since as the *hoofd* (head) *administrateur* of their sugar factories in Central Java throughout the 1880s, he was expected to advise on the installation of new machinery and the like. He was one of the new breed of professional managers whose presence marked the arrival of the 'visible hand' in Java sugar in the decade prior to the crisis of 1884,[14] and his

[12] This was consistent with the extent to which, in metropolitan Holland, the family firm 'persisted' well into the twentieth century as a form of industrial capitalism when elsewhere in Europe (notably in Germany) and in North America it was increasingly supplanted by large companies with 'impersonal' managerial hierarchies. Moreover, as was said also to be the case in Holland, even in big corporations, 'family links played an important role' (Sluyterman and Winkelman 1993).

[13] For Everts in Hilversum, see Engel, Van der Schuyt et al. 2005:167, 227.

[14] Knight 1999.

activities thereafter signalled an ongoing impetus for innovation that had deep roots in the industry. In the mid-1880s, for example, he was one of the leading lights in experiments in Java as to the feasibility of adapting diffusion techniques common in the world's beet sugar industry to the commodity's manufacture from cane.[15] Subsequently (1890-1894), he was the *superintendent* of all the NHM's sugar factories on the island, eventually on the substantial salary of 15,000 guilders a year. Back in Holland, he was far from inactive. From 1897 he was the *directeur* of the limited companies set up around that time by the patrician Lucassen family, owners since the 1840s of a pair of sugar factories on the north coast of Central Java (Everts' old bailiwick), a position he continued to hold until sometime late in the first decade of the new century.[16] He died in Hilversum in 1919.

KEEPING IT IN THE FAMILY

Such continuity of family ownership and management in Java sugar was particularly pronounced in the Vorstenlanden of Central Java.[17] Elsewhere in the colony, however, it was likewise the case that numerous smaller companies or combines existed outside – or in some form of association with – the networks of the great *cultuurbanken*. They were predominantly comprised of enterprises, long established in Java which, for a variety of reasons, had shifted the seat of their business to the Netherlands. This was certainly true, for example, of the Tjomal factory with which S.C. van Musschenbroek was so long associated. During Van Musschenbroek's tenure as *administrateur* there, it was indeed the case that the Internatio *cultuurbank* came to play a major role in handling the factory's affairs. This was far from being an instance, however, of old-style Indies owners 'falling prey' to new metropolitan capital. In fact, there was even a touch of the reverse, for that deeply Indies figure, ex-Governor General Van der Wijck, cousin of Tjomal's owners and long-time associate of Van Musschenbroek, was himself on the board of

[15] *Verslag proef diffusie* 1885.

[16] For Everts's employment with the NHM, see the correspondence relating to him in 'Superintendentie suikerondernemingen', in: NA, NHM, 2.20.01, inv. nr. 7964. These documents identify him as at Djabong, Kraksaan, Probolinggo, in December 1880. For his subsequent career with the Kemanglen and Doekoewringin sugar companies, see NA, NHM, 2.20.01, inv. nr. 7942.

[17] Bosma 2007b.

Internatio. More important in the long term, however, was the fact that the great Rotterdam firm owned no shares in Tjomal, which remained firmly in the hands of the interrelated Van der Wijck and Teding van Berkhout families. Indeed, in the 1930s the largest single shareholder in the Tjomal sugar company was the countess (*jonkvrouw*) Alphreda Louisa Teding van Berkhout,[18] a niece of the man who had bought Tjomal at auction from the Indies government in 1872. A ripe example of the colonial rentier, Countess Alphreda spent much of the latter part of her long life – she had been born in Batavia in 1863 and died 1959 – in northern Italy, surrounded by the elegance and comfort of the Villa Planta in the celebrated sub-alpine resort town of Merano.[19]

The Teding van Berkhout clan was by no means exceptional in keeping ownership firmly in the family. A vignette played out in The Hague in the mid-1880s shows how it might be done: how old-established firms might hold out against the new wave of big financiers. The recently widowed Anna Hoevenaar (1823-1905) had been born to Otto Carel Holmberg de Beckfelt and his wife Henriette Smissaert in Java, where her father subsequently became a pioneer sugar manufacturer. In 1886, following the death of her husband Hubertus, a rich, retired Java sugar manufacturer who had taken over and greatly extended his father-in-law's interests in the industry, she might have appeared vulnerable to metropolitan take-over. Working capital for her Java factories was supplied by the NILM (as we have seen, one of the handful of the newly established *cultuurbanken* set up in the wake of the crisis of 1884) which had inherited a decade-long financial arrangement with the 'Hoevenaar Concerns' from its ailing sister-company, the Nederlandsch-Indische Handelsbank (Netherlands Indies Trading Bank).

However, if the NILM thought that this was the moment to wrest control of the enterprise from this evidently formidable old lady (she clearly inherited qualities from her mother, a woman of spirit, who had separated from her father some five or so years after she had been born) they were sorely mistaken. *Mevrouw* Hoevenaar *née* Holmberg de Beckvelt (she evidently liked the touch of aristocracy that this reminder

[18] *Nederlands Adelsboek* 79 (1988): 489; Jonkvrouw Teding van Berkhout-Senfft von Pilsach, living in Merano, held 136 of the 400 shares in Tjomal ('alle aandeelhouders zijn niet-jood' was how the company was described to the Nazis during the war), see the List of Shareholders as of 31-12-1938, in: NA, NV Maatschappij tot Exploitatie van de Suikeronderneming Tjomal, 1872-1971, toegangsnummer 2.20.39, inv. nr. 66.

[19] C. Schmidt 1986:156.

that she was the daughter of a *jonkheer* conveyed), it may be supposed, had come up to The Hague from her country house at Geldrop in the south-east of the Netherlands, and had with her the family lawyer – and a strong bank balance. According to the company's somewhat rueful record of the encounter, 'the information supplied by Notary Lichtenburg concerning *Mevrouw* Hoevenaar's private fortune was of such a character that the management [of the NILM] saw no difficulty in being satisfied with the declaration of the said lady'. Not surprisingly, Lichtenburg appeared on the board of the limited company subsequently formed to manage the factories. [20] Some half a century later, moreover, the Hoevenaar Concerns still retained sufficient independence to switch their allegiance from the NILM to the NHM at the height of the interwar depression.[21]

Moreover, the 'Java connection' remained firm, in the shape of several generations of another Dutch-Indies family who managed the concerns on behalf of the founder's heirs. The Van Eibergen Santhagens were precisely the kind of 'empire family' whose history provides a further reminder of the long-term interconnectedness between 'colonial' and 'metropolitan' bourgeoisie that was a continuing hallmark of Java sugar's long historical evolution. With deep roots among the commercial elites of Amsterdam, the family also maintained a significant presence in the business world of the Indies for over the better part of a century.

Reinier van Eibergen Santhagens (1797-1869), scion of an Amsterdam patrician family, had spent much of the 1830s and 1840s in Batavia, latterly as Indies manager of the Oost-Indische Maatschappij van Administratie en Lijfrente (in which fund-management and annuity business one of his sons followed him), and three of his four children were born in the Indies. Arent van Eibergen Santhagens, the eldest of them (born Batavia 1833, died Hilversum 1913), married in the Netherlands to an Amsterdam-born woman before subsequently returning to the Indies, where all of their six children either found their marriage partners or settled more or less permanently. Reinier's third son, Daniël Cornelis van Eibergen Santhagens (1847-1920) was born in Amsterdam and educated in the Netherlands.

[20] 'Geschiedenis NILM', circa 1942, p. 56, in: NA, NV Nederlands-Indische Handelsbank; Nationale Handelsbank NV, 1863-1966, toegangsnummer 2.20.03, inv. nr. 329; *Handboek* 1899:618.

[21] 'Geschiedenis NILM', circa 1942, p. 64, in: NA, Ned.-Ind. Handelsbank, 2.20.03, inv. nr. 329.

Subsequently opting for a sojourn in his family's other homeland, this third son arrived in Java during the 1880s and established a connection with the Hoevenaar Concerns that was to carry over into the next generation. His son, Daniël Cornelis van Eibergen Santhagens junior (1874-1959), was born in Amsterdam, began his education in Batavia (where he had accompanied his father) and completed it in Holland, where he went on to become a member of the 'core elite' of the Netherlands Indies' business world. In 1917 he became *directeur* of the Hoevenaar companies, and was also on the board of the Javasche Cultuurmaatschappij (owners of some eight sugar factories in Central and East Java), Nederland Lloyd and Ruhaak & Co, a major Dutch engineering firm that operated both in Holland and the Indies. This was certainly keeping things in the family, since his brother (another) Reinier van Eibergen Santhagens, was one of the top managers at Ruhaak.[22] The family connection with the Indies – and with sugar in particular – was maintained right down to 'the end': on the eve of the industry's nationalization in 1957-1959, a direct descendant of the 'founder' of this Indies-Netherlands dynasty was on the board of NV Suikercultuur Maatschappij, one of the holding companies for the remnants of the Java sugar industry, with its head office in Amsterdam.

SHORT-TERM RESCUE AND THE ABSENCE OF LONG-TERM CAPITAL FLOWS

The salvation of the Java sugar industry in the wake of the collapse of world sugar prices in 1884 was hence an altogether more complex development than has sometimes been assumed. To be sure, the commercial and financial crisis that hit the Java sugar industry in the mid-1880s certainly gave rise to a number of major rescue operations mounted in the capital markets of Amsterdam and Rotterdam. Nonetheless, once the immediate crisis had been dealt with, and the heroic days in smoke-filled rooms along the Heerengracht and Keizersgracht, in what was then the commercial heart of Amsterdam, had passed into the corporate memory, enthusiasm for pumping money into Java sugar declined markedly. In financial terms, the 'rescue' of 1884-1886 was essentially a short-term

[22] See Nederlands Patriciaat, 9 (1918), pp. 346 ff; obituary notices filed in: NA, NHM, 2.20.01, inv. nr. 8994; NV Suikercultuur Mij filed in NA, NHM, 2.20.01, inv. nr. 8300; entries for 'Hoevenaar' Sugar Factories (Pangka, Karang Soewoeng, Adiwerna and Djatibarang) in *Handboek* 1888-1939.

exercise, and did not result in a long-term inflow of investment capital from Holland (or anywhere else).

Between the late 1880s and 1930, overall there was a tenfold increase in the nominal capital value of corporate enterprises operating in the Indies – from 0.4 billion to over 4 billion guilders.[23] What is doubtful, however, is the extent to which this represented a commensurate increase in direct metropolitan investment in agricultural enterprises in Java itself – and in Java sugar in particular. Nor does it demonstrate a burgeoning Dutch enthusiasm for investing in their Southeast Asian colony. After a probable peak immediately prior to the First World War, when around three-quarters of Dutch overseas investment was to be found in the Indies, the proportion declined significantly thereafter. Indeed, by 1938, only 60 per cent of total Dutch overseas investment went there.[24]

Moreover, the bulk of such investment went into oil, mining, transport and 'Outer Island' plantations, rather than into sugar. Of the four billion guilders or more invested in the Indies from any source – local or overseas – circa 1930, only around 800 million guilders (90 per cent or more of which can safely be assumed to be Dutch – see below) were invested in sugar. [25] Moreover, even this degree of investment – in effect representing the equity value of the industry's assets – is not indicative of large inflows of capital into sugar during the preceding decades. Predominantly, the considerable expansion of production that took place in Java between the late 1880s and the end of the 1920s was financed through the ploughing back of profits, rather than through recourse from metropolitan or other overseas capital markets. A number of factors combined to create a situation in which the typical financial strategies of the Dutch family firm – identified by Sluyterman and Winkelman as habits designed to keep 'profits in the company and to build up large hidden reserves to use in adverse economic circumstances'[26] – were adopted by (relatively) large public corporations.

[23] À Campo 1996:74.

[24] Sluyterman (2005:105) observes that '[b]etween 1914 and 1938, Dutch direct investment in the Dutch East Indies more than doubled. However, the share of the colony in the total Dutch foreign direct investment diminished. While in 1914 the estimated stock of accumulated Dutch direct investment in the Dutch East Indies was 75% of total Dutch FDI, in 1938 it amounted to no more than 60%.' For a recent general discussion of overseas investment in late colonial Indonesia, see Lindblad 1998:11-94.

[25] Estimates for 1929 from Keller 1940:13-4.

[26] Sluyterman and Winkelman 1993:153; Lindblad 1994.

A SELF-FINANCED EXPANSION OF PRODUCTION

To be sure, retained earnings were a significant part of the financial strategy of many companies operating in large-scale commodity production in the late colonial Indies economy.[27] For example, Royal Dutch, the great oil company, found it expedient to finance a significant part of its early expansion from retained earnings.[28] In the case of sugar, however, the extent to which retained earnings formed the basis for industry finance appears to have been exceptional. Stereotypically, of course, companies raise money for productive investment either through equity (that is, by issuing shares and creating shareholder capital) and debentures – or through direct borrowing (that is, from banks and other financial institutions). In the case of Java, direct borrowings by the sugar companies were very limited and notional equity capital, when related to the extent of actual investment, remained rather modest.

Perhaps the most significant case in point was the HVA, since this was by far the most expansion-minded of the 'sugar' companies (it had other plantation interests both there and in Sumatra) operating in Java in the early twentieth century. Over a period of three decades, beginning in the mid-1890s, this Amsterdam-based company transformed itself from a general trader with plantation interests into a huge operation with more productive capacity than any of its competitors in the Java industry. Even in the case of the HVA, however, retained earnings played a dominant role in the company's expansion.

To be sure, when the company first embarked on its major expansion, it indeed found a substantial part of the start-up through share and debentures issues in the Netherlands. Thereafter, however, even this, the most 'aggressive' sector of the industry, generally adopted (or was

[27] Writing more than a quarter of a century ago, Creutzberg (1977:27-8) drew attention to the propensity among Western enterprises in late colonial Java toward 'a basic reliance on own (non-borrowed) financial resources; the financing of expansion out of internal sources, mostly by ploughing back operating surpluses'. Van der Eng (1993:21, note 16) draws attention to the fact that 'not much is actually known about retained profits', and cites a 'guess' by W.L. Korthals Altes in *Changing economy in Indonesia*, vol. 7, that, in general, something over one-third (36.5%) of profits were retained for local investment and a contemporary figure of 32.8% for the period 1925-30 (from Prange 1935:91-2). For a discussion of the importance of retained earnings in financing the expansion of colonial commodity production in general in the Netherlands Indies as a whole between circa 1880 and 1940, see Booth 1998:253-60 and the references therein. Around 1913, there were said to be some 198 sugar factories operating in the colony.

[28] Jonker and Luiten van Zanden 2007:33.

obliged to adopt) a more conservative strategy for financing its operations. Almost all their contemporaries and business rivals were even more 'cautious' – if that is indeed the right word. Perhaps the essential point about sugar industry finance in general was made, in typically trenchant fashion, by Pieter Reineke, the driving force behind the HVA, in remarks to his colleagues on the company's board delivered early in the 1920s:

It is difficult to achieve our ends other than through the transfer of profits into a reserve fund and to invest this in new enterprises. It is difficult to raise funds on the open market for new business on account of the delayed returns and because the risks are too great. The result of this policy is that cash pay-outs, that is to say dividends, have to be restricted.[29]

DIVIDENDS AND PROFITS

In explaining how it was possible to finance expansion in this fashion, we need to separate the question of profits from that of dividends. Doing so also helps explain why the industry was possibly less attractive to outside investors than might have been supposed. Prior to the First World War, dividends paid to the shareholders in the Java sugar industry were hardly exceptional and often rather modest (in some years they were not paid at all). Shortly before the war, one contemporary apologist calculated, based on data from around 60 per cent of factories then in operation in the 'government lands' of Java,[30] that between 1893-1912 dividends were in the range of 5 to 12.5 per cent for around half of the enterprises surveyed, while of the remainder around 60 per cent performed better than this and 40 per cent worse.[31] These findings appear to be borne

[29] Notulen bestuursvergaderingen, 1-6-1923/647, in: NA, HVA, 2.20.32, inv. nr. 3.

[30] Circa 1913, there were said to be some 198 sugar factories operating in Java as a whole, the bulk of them – 164 factories – in the directly-ruled 'government territories' and the remainder – 35 in all – in the Vorstenlanden (Paets tot Gansoyen 1913).

[31] Paets tot Gansoyen 1913:1461-3. Paets' exact figures (though subject to many provisos by the author) were that of 111 factories, 55 paid dividends in the 5-12.5% range, 32 paid over 12.5% and 24 paid less than 5%, averaged over the twenty-year period 1893-1912. According to his calculations, only eight factories had paid an average dividend higher than 25% over the period concerned, while some seven had never paid a dividend at all. His overall conclusion (Paets tot Gansoyen 1913:1467) was 'dat er […] een zekere groep [is] van 12 à 16 slechte en een zekere groep van 24 à 28 goede ondernemingen […]; dat het steeds dezelfde ondernemingen zijn, die in de beste condities verkeeren, en dat de groote meerderheid van 50 ondernemingen in gewone jaren niet meer dan een normaal dividend uitkeert'. The author was (from 1902) *landsadvocaat* at Surabaya, and *voorzitter* (chairman) of the Kamer

out, on the conservative side, by what we know of the dividends paid by some of the *cultuurbanken* during the first decade of the twentieth century. These averaged at less than 6 per cent.[32] By way of stark – if somewhat exceptional – contrast, the Royal Dutch Oil Company was paying dividends of a little under 50 per cent immediately prior to the outbreak of the Great War (thereafter, the windfall gains of 1914-1918 enabled the company to amass profits on such as scale as to have to 'disguise' its – politically contentious – super-payouts as bonus share issues).[33]

The Java sugar industry, too, did well out of the war, in so far as the British market, previously supplied from Imperial Germany, was reopened to it. Any improvement in profits was very short term, however, since problems with shipping, and, in Java itself, shortages of rice, led to pressure to reduce the area under cane. The already-cited Hoevenaar Concerns, a three-factory family-owned combine dating from the middle years of the nineteenth century, for example, paid a dividend of 65 per cent in 1916, but very much less than that for the wartime period as a whole.[34] It was only after the war that – from the viewpoint of sugar capital – there was a substantial improvement. Sometimes, indeed, it was spectacular. There is evidence of some small companies paying huge dividends between 1919 and 1929, possibly because they were particularly well situated with respect to land and labour – and almost certainly because they settled for maximizing immediate profits and had little interest in expanding their operations (given what happened at the industry after 1930, an eminently sensible strategy).[35] The Hoevenaar Concerns produced dividends that averaged at 87 per cent in the ten

van Koophandel en Nijverheid there. At the time of his death, in 1913, he was the chairman of the Koloniale Bank's 'Raad van Toezicht' in the Indies (Jaarverslag Koloniale Bank, 1913, p. 1, in: IISG, http://hdl.handle.net/10622/6F6C905E-2B19-4B48-95C5-608CC2D1EE96). His article in the *Archief* was designed (Paets tot Gansoyen 1913:1473-4) to provide the industry with propaganda with which to combat current proposals, emanating from within the Indies government, to compel the sugar factories to pay more for land rental, labour and water, on the grounds that they could well afford to do so. I am not convinced, however, that this invalidates the general thrust of his data. Profits (and dividends) hung very closely on the international price for industrially manufactured sugar. In 1911-1912 – as Paets tot Gansoyen (1913:1404, 1471) readily conceded – prices were indeed relatively high, with a consequent flow-on to dividends.

32 Data from Bosch 1948:681-4.

33 Jonker and Luiten van Zanden 2007:217.

34 *Handboek* 1888-1939. Data for the relevant years for the Mij Exploitatie Karang Soewong, Adiwerna en Djatibrang (also known as the Hoevenaar Concerns): the dividend paid for 1914 was 10% and that for 1915 was 17%. By 1917, the industry was nearly crippled by a shortage of freight room and no dividend was paid. For 1918 the dividend was 29.75%.

35 For a discussion of the differing policies on this score among Indies companies, see Lindblad 1994.

years between 1919 and 1929 – but this included an astronomical 237 per cent in 1920.[36] This was the year of the celebrated 'dance of the millions', when the price of sugar on the New York market hit a high of 22.5 cents per pound and a low of 3.63 cents (a year earlier it had stood at 6.65 cents).[37] There were other, similarly 'fabulous' dividends: the locally based company that owned the Tjoekir sugar factory in Surabaya Residency, for example, paid an average dividend of 65 per cent in the period 1920-1929.[38]

Nonetheless, these remained exceptional cases. Some enterprises had a financial history that bordered on the dismal. The Poerworedjo factory established with such splendid credentials by Van Musschenbroek and Van der Wijck shortly before the First World War was a case in point. Despite being one of the most ambitious enterprises in the colony (or, possibly, because of this), the profits were slow to materialize – even though Van Musschenbroek and his immediate associates seem to have done quite nicely out of setting it up.[39] For the general run of its shareholders, however, Poerworedjo was scarcely a road to riches. Dividends over the life of the factory (it closed for good in 1933, after having been in operation for scarcely two decades) averaged at well below 4 per cent per annum. Even in 1920, the *annus mirabilis* for the Java industry, when world prices skyrocketed, the factory only paid a modest 20 per cent.[40] If this was the best that an ex-Governor General and a high-powered businessman could do for investors, a certain lack of enthusiasm on the latter's part was fully understandable.

Of course, Poerworedjo may have had its own particular problems. Nonetheless, what emerges from the records of the big *cultuurbanken* is

36 For the dividends paid by the Hoevenaar Concerns over the period 1896-1929, see *Handboek* 1888-1939, for the years concerned.

37 See, for instance, Pollitt 1984.

38 Bosch 1948:682.

39 One disgruntled shareholder alleged that what he described as the 'Ramaer *Kongsi*' (that is, Ramaer, Van Musschenbroek, et alia) had made a handsome profit out of selling on to the Poerworedjo company the four concessions for the planting of cane that they had earlier bought up in Kedu (and which formed the basis of the factory's operations). He also alleged that Van Musschenbroek's nephew, H.H. Patijn, had done very nicely indeed out of commissions earned on the initial share issue (W. Bosch, 'Brief aan Aandeelhouders der Suikerfabriek Poerworedjo', Djogja, 3-3-1910, in: NA, NHM, 2.20.01, inv. nr. 7968).

40 Between 1910 and 1932, Poerworedjo paid a dividend on only nine occasions. The average over twenty-two years was 3.6%. Even then, dividends (4%) were only paid in 1910 and 1911 because of the return guaranteed to shareholders by the NHM, an early stakeholder in the project. For the financial history of the company, see the Jaarverslagen Suikeronderneming Poerworedjo, 1910-1932, in: KIT, L 2867.

also a cautionary tale – the more so when the payouts of the 'roaring twenties' are placed in their proper context. Between 1910 and 1929, the year in which prices started to collapse, the average annual dividend paid by the four big enterprises just cited – the KB, the NILM, the HVA and the Cultuurmaatschappij der Vorstenlanden – amounted to slightly more than 22 per cent, a figure that was significantly inflated by the short-lived 'bull market' of 1920. [41] Nor does it reflect the fact that two of these big companies did very much better than the other two, and that the dividends of the best-paying of them – the HVA – were inflated by non-sugar income.[42] The essential point, however, is that the 1920s formed a unique episode in the industry's dividend history: unmatched before then, and never repeated afterwards.

Moreover, even the most generous dividends paid out during the 1920s (they stopped abruptly at the end of the decade) were not all they seemed. Any impression of a shareholders' bonanza needs to take into account the very substantial understating throughout the industry of the equity capital on which profits were distributed. Dividends looked better – in some cases considerably better – than they were, because they were paid on a 'notional' equity capital that was quite unrealistic in terms of the actual sums invested in the enterprise.

For instance, the NILM had eight large sugar factories operational in the 1920s. A realistic valuation – based on a rough assumption that each factory was worth some 3 to 4 million guilders – was that the company's assets were worth somewhere between 24 and 32 million guilders.[43] Nonetheless, the company went through the decade with an equity capital of 15 million guilders – and it is on this equity, of course, that its dividends were paid. In the already-cited case of the Tjoekir factory, for example, not only was the average dividend paid during the 1920s

41 The average dividend for the period 1910-1930 paid by the HVA (which reflected its investments in other plantation crops in Java and elsewhere in the Indies) was 27.85%; the average paid by the NILM was 24.63%. In contrast, the average dividend paid by the Cultuurmij der Vorstenlanden was 12.88%, while the Koloniale Bank paid 11.07%. See for the relevant data: Jaarverslag Koloniale Bank, in: NA, Cultuur-, Handel- en Industriebank, 2.20.04; Jaarverslag Handelsvereeniging 'Amsterdam', in: NA, Handelsvereniging Amsterdam, 1870-1959, toegangsnummer 2.20.32; Jaarverslag Cultuurmaatschappij der Vorstenlanden, in: KIT, L 1486; Jaarverslag Nederlandsch-Indische Landbouw Maatschappij, in: KIT, L 2803.

42 By the late 1920s, the HVA's plantation interests in both Java and Sumatra (where it pushed through a number of big developments from circa 1918 onward), embraced not only sugar but also the production of tea, rubber, tapioca, palm oil and sisal (*vezel*), and covered nearly 90,000 hectares (*Aangeboden door HVA* 1929).

43 Jaarverslag NILM, 1920-1930, in: KIT, L 2803.

vastly inflated by the payout to shareholders of 150 per cent in 1920; 'profitability' was also skewed by the fact that dividends were paid on a capital valuation that was set at a figure of at least two-thirds lower than the factory's actual worth.[44] This sort of thing seems to have been standard practice.[45]

None of this meant, of course, that sugar was not a paying proposition. Rather, it reflected the idiosyncratic character of sugar industry finance. The extent of actual investment was far greater than might be assumed from data relating to equity capital alone, and the real financial position of the sugar companies was further obfuscated by a propensity to accumulate reserves well in excess of statutory requirements. The NILM, for example, had reserves amounting to one-quarter of its equity capital at the onset of the interwar depression in 1931.[46] Contemporaneously, the HVA's total reserves (statutory and 'extraordinary') stood at 50 per cent of the firm's equity capital.[47] The fundamental point, however, was that profits were retained and used to support by far the greater part of the industry's growth. As reported in the 1920s by a well-informed industry insider, for example, the new factories established in Java over the preceding two decades had been built 'without inordinate enlargement' of the capital of the firms involved. At the same time, the cost of renovating existing factories had been met largely out of current profits.[48]

PLOUGHING BACK THE PROFITS

The key trends in the way the industry was predominantly financed were already strongly in evidence during the closing decades of the nineteenth century and early in the twentieth; for example, the compiler of an elab-

44 Tjoekir, somewhat unusually, was owned by a limited company registered in Surabaya rather than in the Netherlands; circa 1920 it was farming cane on around 806 hectares of peasant ricefields, producing 70.4 quintals of top quality sugar (SHS) per hectare (Jaarverslag NV Suiker Fabriek Tjoekir, 1907-1923, in: KIT, L 2958).

45 For contemporary confirmation of the gross undervaluation of industry assets, and observations that (notional) equity capital bore little relation to actual capital invested, see, for example, Paets tot Gansoyen 1913:1458-9.

46 Korthals Altes 2004:323.

47 HVA equity capital in 1930 amounted to 40 million guilders. In addition, the company held 20 million guilders in statutory and extraordinary reserves (Jaarverslag HVA, 1930, in: KIT, LD 106).

48 Prinsen Geerligs 1927.

orate analysis of industry profits made shortly before the outbreak of the First World War (cited above) remarked on how, since the 1880s, many sugar companies had salted away much of their profits into reserves, which had then been used to buy the requisite new machinery and, more generally, to finance the expansion of their enterprises.[49] In this respect, the record of the Tjomal company – with which Van Musschenbroek was for so long associated – is worth citing. Between 1915 and 1928 (the last 'good' year before the interwar depression), the company recorded profits of more than 20 million guilders, of which over one-third was spent on machinery and buildings for an entirely new factory at Tjomal itself.[50]

Moreover, Tjomal was by no means an isolated example of the extent to which retained profits were used to finance expansion. In the case of the four big sugar companies already named – with between them around forty factories by the 1920s – the pay-out ratio (that is, the ratio of dividends to net earnings) was just over 74 per cent over the period from 1910 to 1930.[51] That is to say, something a little over 25 per cent of profits was held back to build up reserves or to fund expansion. In fact, this was almost certainly a conservative estimate of actual retained earnings, since it is not always apparent precisely what capital charges were deducted before net profit was declared. Indeed, as we shall see, in the case of one major company it is obvious that very substantial capital expenditures were placed on the debit side of the ledger before net profit was declared. This may have been a somewhat exceptional situation, but the strategy

49 Paets tot Gansoyen 1913:1454-5.

50 A summary version of the Tjomal company's accounts, 1899-1939, is to be found in NA, NV Maatschappij tot Exploitatie van de Suikeronderneming Tjomal, 1872-1971, toegangsnummer 2.20.39, inv. nr. 28. The costs of the new factory appear under 1923 as 4,837,551 guilders for 'machines' and 1,472,345 guilders for *gebouwen* (buildings) and a further 1,421,335 guilders for *woningen* (houses). All three charges appear under the rubric of Staat van Uitgaven voor Uitbreiding. Reserves in 1923 up to 1928 are booked at around 8 million guilders. It seems inconceivable that with reserves like this, the company would have borrowed money to build the new factory. Indeed, the very modest rise in reserves between 1919 and 1922 – from 1,841,225 to 2,426,956 guilders – when sugar prices went through the roof, would again suggest that the new factory was indeed built from retained earnings (which were not hived away in reserves). Through the entire period 1899-1939, the equity (*gestort kapitaal*) of the Tjomal company remained at 1,000,000 guilders.

51 A payout ratio of 100 means that all the declared profits are being distributed in dividends. Anything lower than 100 is indicative of profits being retained. For the relevant data relating to equity (*maatschappelijk kapitaal*), net profits (*winstsaldo*) and paid-out dividends (*uitgekeerd dividend*), see the annual reports 1910-1930 of the HVA (NA, Handelsvereniging Amsterdam, 2.20.32, inv. nrs 11, 12), NILM (KIT, L 2803), Koloniale Bank (NA, Cultuur-, Handel- en Industriebank, 2.20.04, inv. nr. 6) and CMV (KIT, L 1486).

of retaining profits as the basis for expanding their operations showed up very clearly in the histories of all the big sugar companies.

In this context, the HVA was unusual (at least, among the *cultuurbanken*) in that it went to the Amsterdam financial market for capital to pay for its ambitious, large-scale sugar-making venture in the far south-east of Java in the early years of the twentieth century, as discussed in the following chapter. Later, and equally massive, developments by the HVA, however, were predominantly financed from profits, despite the company's issue of debentures to cover part of the outlays involved. During the course of the 1920s, HVA's equity capital doubled from 20 to 40 million guilders, around half of which was in the form of debentures.[52] Although this was the largest 'declared' capital of any of Java's Big Sugar companies, its financial strategy was altogether more conservative than this might superficially suggest. It may indeed have been the big spender among Java's late colonial sugar companies, but the bulk of its investment in expansion came from retained profits rather than from recourse to capital markets. Notably, in 1921, at the beginning of a decade of major growth, the HVA board decided against a 7-million-guilder share issue (which would have increased their equity capital by more than one-third), because they had enough capital on hand, presumably from the windfall gains of the 'dance of the millions'.[53]

The point was that the company was worth very much more than its declared value of 40 million guilders, and that this 'excess' worth represented investment paid for out of retained profits. Early in the 1920s, when its equity capital still stood at 20 million guilders, ex-CEO Peter Reineke estimated (for the information of his fellow board members) that the 'real' value of the company's investments was more than four times that amount, and placed the figure in excess of 90 million.[54] By the end

52 HVA equity capital in 1930 amounted to 40 million guilders. In addition, the company held 20 million guilders in statutory and extraordinary reserves (Jaarverslag HVA, 1930, in: KIT, LD 106). 'Voor de financiering der exploitatie werd door uitgifte van obligatieleeningen [that is, debentures] eenige malen een beroep op de geldmarkt gedaan: per 31 December 1928 is het uitstaand bedrag aan obligatiën rond f. 20,700,000' (*Aangeboden door HVA* 1929:11-2). The HVA's recourse to debentures was not typical, however, of the industry as a whole, where debenture capital only played a minor role. Debenture capital was indeed significant in the colony, but was mostly tied up, for instance in infrastructural developments and in perennial plantation crops (Manschot 1939).

53 Notulen bestuursvergaderingen, 29-6-1921/624, in: NA, HVA, 2.20.32, inv. nr. 3.

54 Notulen bestuursvergaderingen, 24-6-1923/649, in: NA, HVA, 2.20.32, inv. nr. 3. Reineke also cited the Dutch government's hoofddirecteur van financiën's (chief director of financial affairs) 1919 valuation of the HVA at 97,399,542 guilders.

of the decade, it must certainly have been in the region of 150 million (and possibly substantially more). The sums just kept on mounting up. Prior to 1920, the HVA had invested well in excess of 10 million guilders in its vast sugar-making operation in the south-east of Java – by far the largest factory in the colony – and it subsequently invested at least another 40 million guilders there during the course of the following decade.[55] In addition, at the very end of the 1920s, there was the state-of-the-art Koenir factory in East Java's Brantas valley. This was the last of its kind to be built in colonial Java, which cost the HVA more than 7 million guilders.[56] None of these calculations takes any account, moreover, of the sums spent in the 1920s on HVA plantations in Sumatra (and on Java itself),[57] or on expanding and renovating the other sugar factories that the HVA already owned in and around the Brantas valley. There were around a dozen of the latter, and an educated guess would be that, over the course of the twenties, they would have absorbed perhaps a further 10 million guilders of investment. In total – and it is a fairly conservative total – the HVA's investments between 1910 and 1930 can hardly have amounted to less than 150 million guilders, set against no more than 40 million guilders raised (in one form or another) from financial markets. That is to say, the HVA disbursed in two decades of expansion something in excess of 100 million guilders over and above the capital it borrowed. At most, its retained earnings – in the form of the difference between net profit and what was paid out in dividends – between 1910 and 1930 amounted to only 37.5 million guilders.[58] It has to be assumed (if these calculations are indeed correct) that the 'missing' 60 million or so guilders was accounted for by capital outlays deducted from

55 In 1927, the well-informed and highly sympathetic Indies journalist H.C. Zentgraaff quoted a figure of 60 million guilders as the total sum invested in the HVA's sugar-manufacturing complex in and adjacent to Djatiroto in the far south-east of Java (Z. 1927:11; see also, 'Enkele notities inzake der suikerondernemingen Djatiroto, Semboro, Goenoengsari en Bedadoeng', [1939], in: Internationaal Instituut voor Sociale Geschiedenis (IISG), Amsterdam, Nederlandsch Economisch-Historisch Archief (NEHA), Bijzondere Collecties 640/A 3 (a); Prinsen Geerligs 1927. Zentgraaff's 60 million is largely substantiated in the company's annual reports. Goenoengsari and Semboro had cost together some 20 million by 1926 (Jaarverslag HVA, 1926, p. 11, in: KIT, LD 106) and the projected cost of Bedadoeng was already 11 million by 1926 (Jaarverslag HVA, 1926, p. 11, in: KIT, LD 106) – which would leave the two Djatiroto factories costing together around 29 million, which may be a bit high. For an extended discussion of Djatiroto and the HVA's operations in south-eastern Java, see the following chapter.

56 Jaarverslag HVA, 1927, p. 11-2, in: KIT, LD 106.

57 By 1919, 10 million guilders had already been invested in plantations in Sumatra; see Notulen bestuursvergaderingen, 4-4-1919/595, in: NA, HVA, 2.20.32, inv. nr. 2.

58 Between 1910 and 1930, the HVA's net profits amounted in total to 171,312,177 guilders; the company disbursed 133,750,000 in dividends (Jaarverslag HVA, 1910-1930, in: KIT, LD 106).

gross profits before the net profit was declared. In whichever way the accounting is done, the conclusion has to be that even the HVA, despite being the most highly geared of Java's Big Sugar companies, nonetheless funded the bulk of expansion by ploughing back profits.

Even so, the amount of the HVA's borrowings was unusual (and reflected its uniquely expansionist character) in the industry as a whole. Instead, retained earnings were the rule. To be sure, the Koloniale Bank – which shortly before the First World War either owned or part-owned thirteen sugar factories and financed the operation of nine more – had increased its equity capital by 50 per cent (from 10 to 15 million guilders) in 1911, probably in connection with the outlays on its big, state-of-the-art factory at Bandjaratma, on the north coast of Central Java. This was, however, an exceptional move for the company. At the beginning of the 1920s, in a further expansion of its operations, it bought a string of four factories in the Yogyakarta area, built a new factory to partially replace them and incorporated the remainder in a greatly expanded and renovated existing operation – all without any increase in equity capital or borrowings.[59] Subsequently, the company's directors were authorized to make a significant expansion in equity capital – but largely neglected to do so.[60] Instead, reinvested profits continued to play the key role in sustaining the process of almost continuous technological renovation common to all the leading sectors of the Java industry throughout the twenties. Only when faced with crisis conditions in 1930 (the selling price of the company's sugar had fallen below its cost price) did the Koloniale Bank resort to a debenture issue – which, oddly enough, given the circumstances, was rapidly fully subscribed.[61]

In the case of the CMV, enlargement of equity capital, when it came, was occasioned by matters other than the expansion of productive capacity. In 1918, the company doubled its equity (which had remained constant since its establishment thirty years earlier) from 10 million to 20 million guilders in response to the exigencies of the commercial difficulties facing Java sugar toward the end of the First World War. Above all, a serious shortage of shipping potentially left the industry with huge quantities of sugar on its hands. For this particular company, the upshot

59 Jaarverslag Koloniale Bank, 1920, p. 4; 1921, p. 5, in: IISG, ZK 60149.

60 The proposal was for a share issue to the amount of 10 million guilders. In fact, 8.5 million guilders of this remained '*ongeplaatst*' (Jaarverslag Koloniale Bank, 1923, p. 6; 1924, p. 7, in: IISG, ZK 60149).

61 Jaarverslag Koloniale Bank, 1930, p. 6., in: IISG, ZK 60149.

was a situation in which, by early 1918, 'our financial resources were completely exhausted', thereby necessitating a share issue equivalent to the amount of their existing equity.[62] The complete success of the issue no doubt was due in part to the standing within the 'core elite' (see above) of the company's board of management – but also to the fact that existing equity was far below the actual value of the company's Java assets. By 1930, on the eve of the interwar depression, equity in the company had increased to some 30 million guilders. Again, however, this did not represent the raising of funds to finance the company's expansion: rather, it was the 'bookkeeping' result of a technical reconstruction of the company some two years earlier, and was explicitly not the result of a new issue of share capital.[63]

The record of the NILM was basically similar. This *cultuurbank*, closely affiliated to the Nederlandsch-Indische Handelsbank, by the 1920s was the owner of eight sugar factories and the financier of some twenty more.[64] Equity capital, little changed since the company's foundation in 1885, was enlarged via a share issue by around one-third to 15 million guilders in 1916 to cope with the commercial exigencies of the wartime situation.[65] (The sum involved pales into insignificance in comparison with the 30 million guilders raised during the early years of the twentieth century alone by the NILM's 'parent' company, a firm whose interests were in trade and banking rather than in plantations of any kind.[66]) The converse of this degree of independence from metropolitan capital markets was the extent to which the NILM financed its operations by ploughing back profits. This began early. Between 1899 and 1903, for example, the NILM spent more than 2 million guilders of its profits on new machinery and the like for factories, and left only a little over a third of a that amount for payment of dividends.[67] Between 1919 and 1930, in excess of 10 million guilders was paid from the profits into expansion and renovation of the company's assets, mostly sugar factories (at the same time, a reserve of 3.5 million guilders was built up).[68]

62 Jaarverslag Cultuurmij der Vorstenlanden, 1917, p. 5; 1918, pp. 5-6, in: IISG, ZK 58574.

63 Jaarverslag Cultuurmij der Vorstenlanden, 1928, p. 3, in: IISG, ZK 58574 ('tot uitgifte van nieuw kapitaal werd echter niet overgegaan').

64 Jaarverslag NILM, 1928, p. 5; 1929, p. 3, in: KIT, L 2803.

65 Jaarverslag NILM 1916, p. 6. Equity capital, which amounted to 9 million guilders in 1885, had increased to 10 million by 1913; see Jaarverslag NILM, 1913, p. 9, in: KIT, L 2803.

66 Korthals Altes 2004:177.

67 Jaarverslag NILM, 1903, p. 8, in: KIT, L 2803.

68 Based on data in the Jaarverslag NILM for the years 1919-1930, in: KIT, L 2803. It is worth noting

A CLOSED SHOP

Bound up with – and, in a perverse way, complimenting – the investment strategies that evolved in Java sugar from the late nineteenth century onward, was the extent to which the industry was, in effect, a closed shop. Around 1910, as we saw earlier in this chapter, Van Musschenbroek and Van der Wijck were leading figures in setting up the Poerworedjo factory in Central Java's Kedu Residency. Poerworedjo was one of the very few 'freestanding' new sugar factories built in Java after the end of the nineteenth century. But despite the fact that it did not belong to one of the existing big combines who dominated the industry, it was still very much the creation of 'old' money rather than a sign of the influx of new capital. Its board members included a number of the usual suspects: Ramaer from the sugar syndicate; F.M. Delfos, one-time factory manager and now a director of Kooy & Co, one of the Java firms long specialized in the management of sugar factories; and Abram Muller, NHM director and financial broker.[69] In short, they all represented interests that had already been involved in the industry for decades. It was a neat demonstration of the way in which Java sugar contrived to operate without recourse to 'new' capital.

As well as being rooted in a real difficulty in attracting 'outside' capital, this preference reflected a determination to keep the industry in the hands of the Dutch and Dutch-colonial or Indies bourgeoisie, who had seen Java sugar through the crisis of the 1880s and presided over its subsequent growth. They had no intention of being robbed of their

that these sums for '*uitbreiding en vernieuwing*' were booked against the recorded profits (meaning that the '*winstsaldo*' in the balance sheet of this company does not represent profits per se, but profits minus what had been ploughed back). Developments within the Cultuurmij der Vostenlanden ran on a parallel track. While significantly increasing their ownership stake in the twenty or so factories to which they provided finance, between 1904 and 1908, the company built two new factories (Demakidjo and Wonotjatoer) for around 3 million guilders, totally financed out of the profits. Indeed, the company went out of its way to emphasize the point: '*zonder genoodzaakt te zijn, daartoe van creditmiddelen gebruik te maken*' (Demakidjo) and '*geheel uit eigen middelen*' (Wonotjatoer) (Jaarverslag Cultuurmij der Vorstenlanden, 1905, p. 3; 1907, p. 8; 1910, p. 9, in: IISG, ZK 58574). By 1915, the company directly owned four sugar factories and financed the operations of some twenty more, though by the mid-1920s it had scaled down its operations somewhat, having closed one of its factories (but greatly expanded another) and reduced to eleven the number that it financed (Jaarverslag Cultuurmij der Vorstenlanden, 1915, p. 10; 1924, pp. 8-11, in: IISG, ZK 58574). The company's Soedhono factory in Madiun Residency was extensively rebuilt in the mid-1920s and its plantation area was increased by around 70%. The whole operation was revalued from 900,000 to 3,200,000 guilders, with the whole project paid for out of the profits (Jaarverslag Cultuurmij der Vorstenlanden, 1924, p. 8; 1925, p. 6, in: IISG, ZK 58574).

69 Prospectus Poerworedjo, November 1908, file 'Poerworedjo', in: NA, NHM, 2.20.01, inv. nr. 7968.

hard-won gains. As we have seen, all the *cultuurbanken* – or their immediate precursors – had been active in the Indies before the crisis of 1884, and used the occasion both to shore up and consolidate their hold on the industry. None of the subsequent newcomers were sizable operations (Poerworedjo excepted), and after 1914 no new Dutch firms whatsoever – and a negligible number of foreign ones – entered the industry.[70]

The corollary of this exclusivity was the extent to which the industry succeeded in keeping out 'new' capital, even to the point of the major sugar companies being very reluctant (as we have seen) to increase their own share capital. The self-contained character of the industry was also reflected in the extent to which the major 'sugar' companies remained in the hands of a fairly small group of big shareholders, closely connected to company management. In the case of the HVA, for example, it was said in 1911, when the company's equity capital stood at 10 million guilders, that 'the Directors and Commissioners represented about half the issued share capital'.[71] Six years later, by which time equity capital had increased to 15 million guilders, the board's hold appeared to have been somewhat weakened, but the board and management still held nearly 27 per cent of the stock, the remainder of which was said to be spread widely.[72]

These points gain in significance when it is realized that the agricultural commodity sector of the Netherlands Indies as a whole was extensively permeated during the early twentieth century by new capital, a significant proportion of which was non-Dutch (primarily British and North American).[73] At the end of the 1920s (estate) rubber – the new growth industry of the early twentieth-century Indies – was more than 50 per cent owned by British and other 'foreign' companies; palm oil, 40 per cent; and tea and coffee, around 30 per cent, whereas over 90 per cent of Java sugar was in Dutch hands.[74] To a quite singular extent, that

70 Prinsen Geerligs 1927.

71 Claver 2006:263.

72 Notulen bestuursvergaderingen, 7-12-1917/477, in: NA, HVA, 2.20.32, inv. nr. 2. This board minute relates to pressure from the British ambassador to the Netherlands re suspected German shareholding in HVA. The HVA board was told that an investigation by the *directie* showed that 8,000 of the 30,000 HVA shares (that is, nearly 27%) were held by *het bestuur* (that is, *commissarissen* and *directie*).

73 Whereas at the beginning of the 1920s (1922) the British, American and 'other foreign' presence in the sugar industry was of negligible proportions, it amounted to over 40% of the total value of investments in other parts of the plantation sector (rubber, tea, et cetera) and to around 5% in the case of oil and mining (Creutzberg 1977:25, Table I; for the wider picture, see Lindblad 1998).

74 For a breakdown of the figures and a discussion of the problems of estimating the extent of investment, see Taselaar 1998:44-6.

is to say, the industry was and remained the preserve of Dutch capital. British capital had almost no presence,[75] even less that of the United States, while the Japanese, despite their massive commercial importance to the industry by the early 1920s, never established more than a tiny bridgehead (scarcely a handful of factories) in Java sugar's production sector. Whatever the ambitions of Japanese capital in this respect – and there is some indication that during the First World War they were indeed keen to buy substantially into an industry that was currently the major supplier of Japanese refineries – they encountered considerable resistance from the Dutch side. The HVA, who were presumably not alone in this, were firmly against the sale of factories to Japanese interests, and believed that their stand had the backing of the government in The Hague, for whom Japanese penetration of the industry was said to be '*onaangenaam*' (unpleasant).[76]

Nor was Indies-Chinese capital overly in evidence in the industry. There has been a tendency to exaggerate its presence, consequent, perhaps, on the dominance of 'Chinese' entrepreneurs in the late twentieth-century Indonesian economy as a whole.[77] By the opening decades of the twentieth century only a small minority of Java's big industrialized sugar factories (the ones that catered to the export trade in the commodity) were in the hands of Indies-Chinese owners. The largest Chinese sugar concern, the Oei Tiong Ham Concern (OTHC), had only five factories, despite its very substantial presence in the commercial life of the colo-

75 The Maclaine Watson combine's ownership of several major factories and its financial ties to a number of others may technically have represented 'British' capital investment. In reality, the firms concerned were old-established enterprises whose roots were essentially (Dutch) colonial rather than (British) metropolitan.

76 Notulen bestuursvergaderingen, 7-9-1917/474, in: NA, HVA, 2.20.32, inv. nr. 2.

77 Lindblad (1998:75) cites the work of Howard Dick (1993) to suggest that circa 1924, 'the sugar concern' left behind when Oei Tiong Ham died 'had an equity of f. 40,000,000', a figure apparently equalling the nominal equity of the HVA. This figure is repeated in Post 2011:183-4. The figures which Post supplies for the stated equity of the OTHC's sugar factories does not, however support this '40 million' figure. Indeed, the stated equity (from the *Handboek* 1888-1939, apparently) for the OTHC's five sugar factories (Redjo Agoeng, Tangoelangin, Pakkis, Poenen and Krebet) amounts in total to only 3,400,000. Of course, throughout the sugar industry, the actual value of factories was habitually grossly understated. OTHC's Redjo Agoeng, for example, is assigned an equity value of 600,000 guilders. In fact, it was one of Java's largest sugar factories, with a plantation area (1930) of well over 2000. At a guess, it must have been 'worth' at least 6 million guilders on 1930 valuations (the other OTHC enterprises were not in that league). Be that as it may, the stated equity (book value) of the OTHC's sugar factories remains at less than 3.5 million guilders and that figure (rather than the fanciful '40 million') is the value that has to be compared with other (Dutch) sugar companies, whose 'real' assets were likewise grossly undervalued in the equity capital data listed in *Handboek* 1888-1939.

ny.[78] Indeed, the entire Indies-Chinese stake in the industry probably amounted to some twenty factories, or approximately 12 per cent of the total number of such operations.[79] To be sure, one of these factories – OTHC's Redjo Agoeng in East Java's Madiun Residency – was among the dozen or so largest operations in the colony. Most notably, it was also the first in Java to have fully electrified operation (1928), thereby usefully dispelling any colonial myth that Chinese-owned factories were by definition technologically retrograde.[80] Nonetheless, Indies-Chinese capital remained a relatively minor presence on the production side of the industry, despite the ongoing importance of Chinese interests in the trade in sugar.

PAST, PRESENT AND FUTURE

In summary, Java sugar entered the age of mass production in a quite singular fashion. As we have seen, this singularity was not only confined to developments in the agricultural sphere of production, which were reviewed in the previous chapter; it also related to the unique nexus in Java between sugar capital and the colonial state – a nexus that was at once both deeply beneficial and profoundly constraining. Capital, of course, also mattered a great deal, and the present chapter has argued that Java sugar's singularity also extended into important aspects of the ways in which production was financed and the industry owned. On this count, sugar was, by some margin, the least internationalized of Indonesian export commodities in the opening decades of the twentieth century. Moreover, even within the 'Indies business community' in the Netherlands, Java sugar remained, if not exactly isolated, then at least

78 For a report from the company's Surabaya office that it was in negotiations with OTHC over the purchase of four of its five factories (Redjo Agoeng, Tangoelangin, Poenen and Krebet) for around 10 million guilders, see Notulen bestuursvergaderingen, 4-10-1918/488, in: NA, HVA, 2.20.32, inv. nr. 2. 'Majoor Oeij Tiang Ham' was proposing to retain only his Pakkis sugar factory (nothing came of the proposal). At the end of the 1930s, only Redjo Agoeng and Krebet were operating.

79 Based on the information in Paets tot Gansoyen (1913:1450, 1453), it would appear that circa 1913, no more than 20 (at the most) of the 198 industrialized sugar factories listed in Java at that date belonged to Chinese interests.

80 The normally reliable Howard Dick (1993:276) subscribes too readily to the claim that OTHC's Redjo Agoeng sugar factory was 'the largest in NEI'. In fact, at that time it was one of a select group of eight factories that planted in excess of 2,000 hectares of cane annually, and was dwarfed by the Dutch-owned Djatiroto operation, which had an annual planting in excess of 6,000 hectares (see, for example, *Korte mededeelingen* 1931:90-4.

separated from other, more recently developed commodities such as rubber and oil, by virtue of its long history and distinctive mode of finance.

In the short term, this latter aspect of the industry's evolution over several decades meant that Java's sugar companies were well placed to ride out the interwar depression, in so far as they had few debts and generally large reserves. Partly in consequence of this, the industry was able to stage a considerable revival in the late 1930s (a point often neglected in the literature). To be sure, the commercial prospects for the industry, as we shall see, remained doubtful at best. Nonetheless, large parts of the industry had weathered (just) the worst of the depression though the strength of their reserves. At the same time, the existence of a massive and largely intact infrastructure, coupled to the historically extremely low cost of land and labour inputs, proved irresistible to people – in the industry and in government – who found it hard to think of Java without Big Sugar. All this, however, is to anticipate the discussion of subsequent chapters.

Chapter 5

Enmeshed in Lilliput

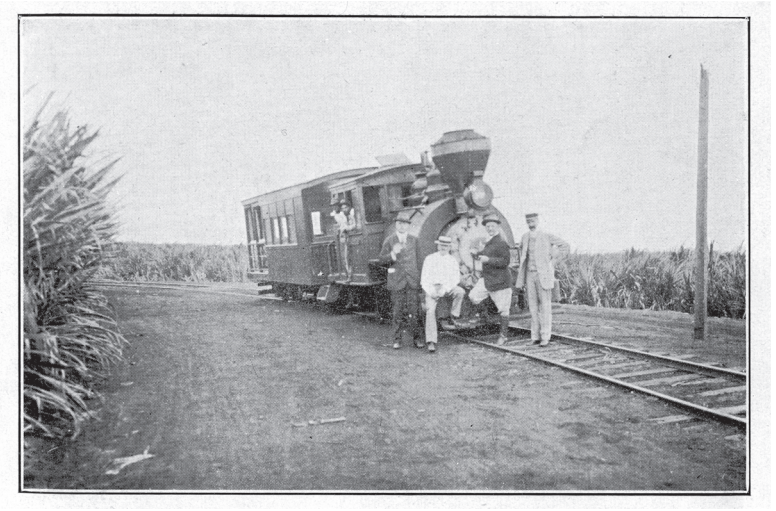
Constraints on growth

During the middle months of 1911, a small delegation from the Java sugar syndicate paid a visit to their counterparts in Hawaii, where an American-run industry, although relatively small by international standards, was one of the most advanced in the world. To be sure, its manufacturers lacked the immense field-labour force of their colonial Indonesian contemporaries, and likewise lacked the resources to fully replicate the kind of R&D in which Java had become world leader. With evident satisfaction the visitors found not only that their Hawaiian counterparts employed a woman well-versed in the Dutch language in their own research station, but also that copies of the publications of H.C. Prinsen Geerligs, the Java industry's leading savant, were located in the laboratories of many Hawaiian factories.[1] Nonetheless, the three men who formed the delegation – a top executive of the syndicate (J.W. Ramaer),[2] an agricultural expert (J.E. van der Stok)[3] and an

1 Ramaer 1913:1-27.

2 For Ramaer, see Chapter 3.

3 Johan E. van der Stok (1880-1958), like the majority of his Dutch counterparts in the Indies, had been born in the colony. His father was director of the Indies' Meteorologisch Instituut, and like similarly well-off colonial contemporaries, the young Van der Stok was largely educated in Holland. Returning thereafter to the Indies, his trajectory was an idiosyncratic one. At the time of the visit to Hawaii, he was the director of the industry's research institute (Proefstation) at Pasuruan in East Java. Subsequently, however, after working as an agricultural advisor to the Indies government, he moved in 1925 to a professorship at the Landbouw Hoogeschool (later Universiteit) at Wageningen in the east of the Netherlands. But there was another side to Van der Stok. He was much influenced throughout his life by theosophical ideas. What one recent historian has referred to as 'the genteel idiosyncrasy of Theosophy, combining supposed ancient wisdom of the East with the modernity of the West', was attractive to many among the Javanese elites of the Indies, as well as to colonial Europeans (Ricklefs 2007:162). In Van der Stok's case, it led him toward schismatic, mystical Christianity, and during the final decades of his life he became a leading figure in a breakaway, 'charismatic' sect (the Vrij-Katholieke Kerk, which he had joined in 1919 while still in Java), in which he was revered as a noted clairvoyant (*helderziende*) (see www.kingsgarden.org/nederlands/organisaties/lcc.nl/VKIS/Geschriften/Liberaal/vdS, accessed 28-4-2009).



An excursion to Hawaii, 1911: A delegation from the Java sugar industry visits an American counterpart (Ramaer 1913: Volume 3)

industry engineer (F.W. Bolk)[4] – found their visit instructive.

By the time that the deputation sailed for Hawaii, Java boasted a remarkable agro-industry in the cane field unmatched elsewhere in the international sugar economy. Even so, industry executives were beginning to see their enterprise as fenced in by obstacles that appeared to preclude the possibilities of further advance. Though its immediate purpose was ostensibly more limited, the delegation's visit to Hawaii highlighted con-

4 After attending the HBS in his home city of Utrecht, F.W. Bolk (1875-1926) subsequently graduated in 1887 as an engineer (*werktuigkundig ingenieur*) from the Delft Polytechnische School – the foremost institution for technical training in the Netherlands. Like many young Dutchmen similarly qualified, he sought employment overseas – but in South Africa rather than the Indies. However, the subsequent outbreak of the Boer War – the bitter and brutal affirmation of the British Raj in southern Africa that ended the autonomy of the Dutch settler states there – nipped in the bud a prospective career in the Transvaal railways. It forced Bolk to return to Holland, where he found work with Stork, the country's leading engineering firm and great fabricators of sugar-manufacturing machinery. It was this latter connection that took him to the Indies, where he arrived in 1903 as Stork's agent at Salatiga, in Central Java. Two years later he took up employment in the sugar syndicate's research institute at Kagok (Pekalongan) on the north coast of Central Java, where he initially worked under Prinsen Geerligs. At the time of the visit to Hawaii, Bolk was *directeur* of Kagok's technical division. Subsequently, he left the employ of the syndicate, and at the time of his death in Surabaya in 1926 – following an unsuccessful operation on his kidneys – he was the technical advisor to a group of East Java sugar factories (Langgruth Steurwald 1926).

straints that called into question the whole agro-industrial project in the field on which the industry had staked its future.

ENMESHED IN LILLIPUT

For all three men, no doubt, the visit to Hawaii had its pleasurable side. They sailed there via Yokohama on the *Tenyo Maru, a* Japanese ship of the Toyo Kisen Kaisha line. A company of 'cheerful and companionable' Americans introduced them to the joys of baseball and, once arrived at their destination, they were fêted by their Hawaiian counterparts. They had introductions from the American consul in Surabaya, 'but our best introduction was the fact that we came as representatives of the Java sugar industry'. Nonetheless, there was much to ponder on.

Indeed, undoubtedly the most poignant lessons drawn from the visit concerned the contrasts to be drawn between the agrarian and agricultural context of sugar production in Hawaii and that of contemporary Java. Famously, the Java sugar complex was embedded in the Lilliputian world of Javanese peasant agriculture. Lilliput in this case meant an absence of big landholdings; a countryside dotted with tiny, fragmented farms (whose minute scale was reflected in an immensely intricate web of relations of production); the organization of those farms into village and sub-village units; and a complex network of irrigation, scaled equally minutely at the village level to the requirements of peasant agriculture. In the past, arrangements for implanting the cultivation of cane within the existing and reconstructed parameters of peasant agriculture had served the industry well enough. It secured the sugar factories' access to existing farmland, and hence precluded any time-consuming and expensive need to open up virgin soils. Even more importantly – perhaps even crucially – it brought in its wake a ready-made workforce comprised of those sectors of the locally settled peasantry who would otherwise have tilled the fields (as farmers or as labourers) that *wisselbouw* brought under cane. By the early twentieth century, however, the drawbacks were starting to become apparent.

Most obviously, the notionally finite amount of land available for cane production in a relatively small, and already densely populated, island placed physical obstacles in the way of the industry's further expansion. By 1900 some twenty-five million or more people were already

crammed into Java's often mountainous 126,000 sq km – and this number was to double by 1930. Big Sugar – however reluctantly – had to accommodate its operations to the simultaneous requirements of the petty farming communities. In turn, this placed potentially serious obstacles in the way of the further development of that agro-industry in the field on which Java sugar had come to rely. For a variety of reasons, therefore, the little party from the syndicate that had journeyed to Hawaii in 1911, found themselves gazing wistfully at the great expanses of cane that met their eyes, and pointedly recording the absence of intervening villages that were the ubiquitous features of the fragmented sugar plantation in Java: 'for the Java planter it is a striking sight, all the thousands of integrated hectares of sugar cane. Without kampongs, without variation in growth…'[5]

As it was, enmeshed in Lilliput, the problems facing the industry were obvious enough. Field productivity had reached a plateau or was actually declining and, as the industry executives were keenly aware, costs were rising. According to contemporary industry analysts, however, the most fundamental problem was less the quantity of cane that was being produced, but rather its quality.[6] The telltale data related to the *rendement* – the industry's (global) term for manufacturing yield based on the ratio between the weight of cane milled and the amount of sugar produced. In the Java industry on the eve of the First World War, the *rendement* was stationary (or even declining) and had been so for the previous two decades. This might have reflected a degree of obsolescence in the industry's manufacturing sector: a failure of the factory to keep up with the field; however, this was emphatically not the case. Manufacturing in Java had kept abreast of developments in the international sugar economy and, in some respects, was ahead of them. Instead, the real problem was that impressive increases in the amounts of cane harvested per hectare had not been matched by any improvement in sugar content. On the contrary, all the signs were that this had declined.[7]

5 Ramaer 1913:2.

6 For the data in this paragraph – together with the author's mordant commentary – see Dickhoff 1914. Dickhoff was the long-time editor of the *Archief* and a well-respected figure in the industry.

7 Cane yields arrived at a plateau of a little over 1,000 quintals per hectare (1,200 *picul* per *bau*) in 1908, with no significant increase discernable thereafter. Rendement stood at 10.36% in 1894 and at 10% in 1908. Between times it had fluctuated between a low of 9.57% (1900) and a high of 10.77% (1902); between 1909 and 1913, it had averaged just under 10% (Dickhoff 1914:613-4).

THE AGRARIAN QUESTION: BIG SUGAR AND PEASANT 'UNREST'

By no means all of the industry's problems, however, were agricultural in origin. The decade of the 1910s (as has been widely recognized) saw considerable agitation in rural Java, associated with the emergence of 'peasant nationalism' articulated, above all, by the religiously inspired Sarekat Islam (SI, Islamic Union) movement. With branches throughout the localities in which the sugar factories operated, and with a modern-style central leadership, the movement rapidly gained adherents in rural as well as urban Java and became a conduit for peasant grievances in a totally unprecedented fashion. The Sarekat Islam had, of course, a substantial ideological and cultural dimension. Famously, it reflected a form of proto-nationalism operating in tandem with an Islamic resurgence of the kind associated with the *soi-disant* 'purer', *santri* ('orthodox' Muslim) forms of the religion as then practised in Java. Yet, the peasant agitation associated with the movement was also rooted in particular economic circumstances for which the sugar industry was itself at least in part responsible.[8]

Land and the terms and conditions on which the sugar industry rented it from the peasantry were the main issues, with the emergence of worker militancy at times not far behind. Subsequent to the dismantlement of the *Cultuurstelsel* in the 1870s and 1880s, Java's colonial sugar companies had staked a great deal on a variety of devices to obtain access to land for cane growing on terms that made possible the agro-industrial transformation of the cane field. As has been argued earlier, it was this transformation on which Java sugar relied to keep it competitive internationally. At the same time, the companies had come to rely on the availability of large, even limitless, numbers of peasant-workers whose 'docility' – inter alia their amenability to the discipline of industrial-style organization in the field – was a key, albeit largely unspoken, assumption on the part of their employers.

As far as the rental of land was concerned, the position in which the industry found itself in the opening two decades of the twentieth century was complex. On the one hand, there can be little doubt that the old

8 For an overview of the social and economic conditions in the 1910s and their 'political' ramifications, see Van Dijk 2007:515-78. For a richly detailed account of developments relating to the sugar industry in a key location in East Java, see Elson 1984:195.

ways associated with the era of the *Cultuurstelsel* – meaning a combination of coercion, accommodation and habituation – inculcated over several generations were not swept away in its wake. Yet, there was rather more to it than that, since there were a number of crucial new developments. The sugar factories worked in cahoots with village headmen, as the industry had always done. At the same time, however, if and when they could manage it, they also collaborated with other, better-off peasants – the term sometimes used was village 'capitalists' – who either owned or had control over substantial amounts of land – to manipulate to their mutual advantage the chronic indebtedness of the mass of poorer village farmers. In so doing, they enjoyed a varying degree of support from local-level state officials, both Dutch and Javanese, who sometimes turned a blind eye to what went on, sometimes facilitated it and sometimes took exception to it.[9] This latter could be a problem. So, too, was the fact that relations between the sugar industry and 'big peasants' – *grootgrondbezitters* in colonial parlance – were not necessarily harmonious. Not least, this was because the latter had interests that might well be damaged by the sugar industry's drive to rent ever more land. Nor was it self-evident that petty landholders and the functionally landless among the peasantry invariably acceded to the authority of the socially and economically dominant elements among the peasantry. In short, the circumstances surrounding the rise of rural unrest in Java in the opening decades of the twentieth century were complex indeed.

In these conditions, it was by no means plain sailing for the sugar companies. Cane's location in the political economy of rural Java was one in which, to adopt a useful modern jargon, the conflict between notionally hegemonic and subaltern forces – as well as among the latter – was both ongoing and multi-faceted.[10] This was very much the case during the 1910s, when a number of factors came together to create a particularly difficult, even ominous, situation for Big Sugar. What undoubtedly contributed mightily to the gathering crisis was the fact that, during the years

9 For a selection of contemporary and recent discussions on the political economy of 'peasant' Java in the context of the sugar industry's rental of land, see, for example, Muhlenfeld 1907:775-7; *Grondverhuur suikerfabrieken* 1908; Schmalhausen 1909:89; Breman 1983:34; Elson 1984:127; Fernando 1995.

10 The point is elegantly made, though in an entirely different context, by Nederveen Pieterse (1995:184): 'The tendency [is] to think of power in terms of simple schemas, reducing the field of hegemony to a polarised contest between dominant and subaltern forces. Hegemony, however, may be better thought of as an ongoing jostle, ever in motion and requiring continuous effort [...]. Even in polarised situations [...] it is important to monitor the actual transactions taking place and to probe into the nodal points of interaction.'

around 1910, the engrossing of land by the sugar companies reached new heights. In part, this development was fuelled by an internecine struggle for comparative advantage among the industry's main players. An equally important (and associated) factor, however, was a common need to increase the throughput of manufacturing plants whose financial results were far from encouraging: the industry as a whole sought an answer to its problems by expanding the volume of its output in an effort to reduce the unit costs of production. Its efforts in this direction were further stimulated, moreover, by the contemporaneous introduction – worldwide – of new techniques and machinery for achieving a multiple milling of cane that promised significantly improved manufacturing yields – but which also implied the possibility of increased throughput.[11]

The upshot was very apparent in the years immediately before the outbreak of the First World War, when the industry's usually healthy appetite for land temporarily reached gargantuan proportions. In Java as a whole, between 1905 and 1916 there had taken place a 50 per cent increase in the area under cane (105,000 to 157,000 ha), with the biggest increase (11,000 ha) taking place between 1911 and 1914. In a specific number of key production areas on the north coast of Central Java, moreover, the increase in the amount of land taken by cane was much greater.[12] Even so, this is to greatly oversimplify the dynamics of the situation. Cane was not the only 'commercial' use to which land was being put. Quite the contrary: apart from 'subsistence' rice production, peasants also grew many 'market' crops on this part of the north coast. Hence, Big Sugar's appetite for yet more land represented a very significant degree of foreclosure on 'peasant' economic activity, especially that of the 'big peasants' – and their financiers among Indies-Chinese business interests in nearby towns.[13]

All in all, there were many signs that by opting for all-out expansion, the industry had overreached itself. The forward movement initiated by the sugar companies at the beginning of the 1910s would appear to have threatened the whole system of coercion-accommodation on which they had hitherto relied for their successful operation. The rapid engrossing of far more farmland than had ever previously been the case

[11] On the development – and significance – of multiple milling, see, for example, Dye 1998:110-3.

[12] Data from Creutzberg 1975:75, line 38.

[13] For a detailed account of the situation in this part of Java during the early years of the twentieth century, see Knight 1993.

risked alarming those state civil servants who already thought that sugar capital was pressing too hard on the peasantry. It also risked alienating those elements within the peasantry itself on whose 'understanding' the industry relied to ensure the effectiveness of the system of land rental. Other factors acted to exacerbate an already difficult situation for Big Sugar. A fairly steep rise in rice prices in the years immediately before and, especially, after the First World War caused farmers to demand more for their land and further upset the always somewhat tenuous relations between the sugar factories and peasant landholders. The upshot was that the industry found itself in largely unprecedented difficulties over the rental of their fields for cane. Extensive firing of cane fields – ostensibly by disgruntled farmers – was a possible index to the degree of discontent with which the factories had to contend.[14]

Nor was land rental the only problem besetting the industry. At various times during the 1910s, labour was also at a premium. Java's fabled 'cheap' labour was not quite the limitless bonanza that it sometimes appeared to be. Indeed, in at least some of the most densely populated (and hence potentially labour-rich) parts of the island, the insufficient supply of workers, especially for the preparation of ground for the planting of cane, was a constantly reiterated complaint in the industry's own internal reportage. Alternative forms of employment were readily available for those peasants who relied on wages for their subsistence, or needed to supplement the income from their meagre holdings. Inter alia, work was to be had in railway construction, in large-scale irrigation projects and in the increasingly commercialized agricultural activities of other, better-off peasants.[15]

Against this general background, the demand for labour caused by the industry's own rapid expansion between 1905 and 1914 was probably the prime factor in transforming a 'difficult' situation into one of outright crisis. Workers were often in short supply and hence better placed to dispute the terms and conditions of labour than had been the case for a generation or more. In turn, this situation was exacerbated at various times during the 1910s, when industry wages were significantly

[14] For example, Elson 1984:187-9. As Elson (1979) points out, however, the firing of cane, though sometimes directed against the factory (inter alia, its effect of forcing the immediate harvesting of cane might result in its early return to peasant cropping) might also reflect quarrels among the peasantry themselves.

[15] For an extended discussion, see Knight 1994.

out of kilter with rising food prices in the countryside. It was no accident, therefore, that the decade was one of ongoing disputes between the industry and its various workforces in both field and factory. These culminated in 1919-1920 in an almost unprecedented wave of strikes, which affected around 40 per cent of the Java factories and involved thousands of workers. Inter alia, a worker's trade union – the Personeel Fabriek Bond (PFB, Union of Factory Personnel) – was called into existence, and Sarekat Islam activity in the countryside rose to a new peak.[16]

Nonetheless, there is a danger of overstating the role played by peasant and labour activism – and the closely associated role of the Sarekat Islam in particular – in the agrarian problems that confronted the sugar industry during the decade of crisis. At various times, and particularly in the years immediately before the First World War, there were indeed signs of panic in industry circles. A famously cited case dating from 1913 has one sugar company, 'with an eye to the rising unrest among the native populace' advertising for 'a capable Netherlands Indies military officer, willing to advise the management of several large enterprises concerning the preparation of the enterprises against attack'.[17] Others, however, saw matters rather differently. In this same year, for example, one factory manager reported to his employers in Holland that the Sarekat Islam had caused few problems in his part of Central Java. Inter alia, the fact that its local leader had just absconded with the organization's funds (around ninety guilders) had damped down enthusiasm somewhat.[18] Of course, too much should not be read into sardonic comments of this kind, but they do serve as a corrective to more inflated accounts of the role of activism in the crisis facing the industry. Indeed, in the crisis years at the end of the First World War, a greater immediate threat was posed to the sugar industry by the terrible depredations of the influenza epidemic of those years than by nationalist agitation.

The 'Spanish' influenza (it most probably originated in North America) first appeared in the Indies in the middle months of 1918. It was a second wave of the disease, however, beginning in October of that

[16] The authoritative treatment of the subject remains Ingleson 1986:169; for the *Oosthoek* in particular, see Elson 1984:195-204.

[17] Quoted in McVey 1965:13.

[18] J.H. Westenenk to S.C. van Musschenbroek, 24-5-1913, in: Stadsarchief Amsterdam, Archief Handels- en Cultuurmaatschappij Van Heekeren & Co, toegangsnummer 584, inv. nr. 1166.

same year, that resulted in by far the greater mortality and morbidity. In total, at least one and a half million people died in the Indies as a whole. In Java itself, the worst-affected areas were in the eastern parts of the island, particularly the Kediri and Madiun residencies south and west of Surabaya, and in the Oosthoek districts to the east of the city.[19] These were among the most heavily 'sugared' parts of Java, and the ramifications of the disease were quite clear to factory managers there, who noted that mortality and sickness was so bad in the surrounding villages in late 1918 that preparations for the main rice crop were seriously retarded. At one big East Java factory, for example, it was reported that the harvesting of rice, when it finally took place in the following year, occurred very much later than usual. In conjunction with the need to get to work on planting second crops, this late harvest played havoc with the industry's own recruitment from an already denuded pool of labour. In so doing, as will be discussed shortly, it forced up costs substantially.

FERTILIZER, IRRIGATION AND DRAINAGE

But the agro-industrial project in the field was beset during the 1910s by other than purely agrarian difficulties. Fertilizer was perhaps the most obvious case in point. As we have already seen, sulphate of ammonia (or ZA in its Dutch abbreviation) was the nitrogenous fertilizer of choice in Java sugar from the late nineteenth century onward. As such, it was the object of great enthusiasm in an industry in which the female labour used to apply it was singularly cheap – and its advantages apparently so manifest. Indeed, that very enthusiasm for ZA as a 'magic' ingredient was part of the problem. Studies done elsewhere (and at a later date) have demonstrated unequivocally what some contemporaries already suspected: namely, that there was a point beyond which the application of ZA ceased to produce commensurate returns in higher yields of cane; indeed, it might even become counter-productive. Over the long term, the use of sulphate of ammonia in large quantities leads to a quite sig-

[19] C. Brown 1987. For a succinct global survey, see Killingray 2003. Killingray (2003:31) remarks that globally 'the group most universally at risk were the young and the fit, whereas C. Brown (1987:242-3) is cautiously inclined to accept the (very limited) findings for Indonesia that mortality was highest among the very young and among the old.

nificant acidification of the soil, and highly acid soil is not conducive to the production of good quality cane.[20] Achieving optimum dosage was hence of the utmost importance, not simply because exceeding it wasted money, but because excess dosage of nitrogen resulted in a situation in which the full potential of fertilizer application – which was to achieve both higher yields of cane and cane with a high sucrose content – was not being reached.

There was a wider context, moreover, in which the system of *wisselbouw* that dominated the industry came to be seen as standing in the way of those developments in agricultural technology that needed to be implemented in Java if the potential of the field sector was to be fully exploited. Again, it was the industry's early contact with Hawaii – established a decade or so prior to the visit by Ramaer and his colleagues in 1911 – that pointed to Java's deficiencies. In particular, the excellence of the arrangements for irrigating (in some cases) the permanent cane plantations of the Hawaii islands provoked invidious comparison with Java, where the shifting nature of cane cultivation, determined by annual exchange of fields with peasants, precluded such possibilities. At the very beginning of the new century, for example, the HVA had sent one of their factory managers to Hawaii, where he had observed the effectiveness of the irrigation systems installed on the island group's permanent plantations. He noted that 'irrigation water is to be had at all times', and compared the situation very favourably with that of Java: 'how many cane fields either fail or do not produce what they ought to produce, because the necessary irrigation water is not available'.[21] Taking as an example, the important north-coast sugar belt (Cirebon eastwards up to and including Semarang), there were at least four years in the second decade of the twentieth century when 'drought' – meaning either an exceptionally rainless dry monsoon or a particularly short wet one – was recorded as having adverse effects on the cane crop.[22]

The limitations on irrigation imposed by the exigencies of *wisselbouw* were one factor in checking the industrial-agricultural transformation of the cane field; drainage was another. Sugar cane, much as it likes

[20] Humbert 1968:157, 178-90, 213.

[21] Castens 1902:83. Castens was *administrateur* of the HVA-owned Tegowangi sugar factory in Kediri.

[22] See, for instance, the report from the NHM's recently established Soemberhardjo factory on the north coast of Central Java that (1913) 'de aanplant heeft door een korten Westmoesson, gevolgd door een lange droogte, sterk geleden' (Jaarverslag Soemberhardjo, 1914, p. 3, in: NA, NHM, 2.20.01, inv. nr. 9395). Similar reports were rife throughout the 1910s.

moisture, does not like wet feet. As one authority has remarked, 'the removal of excess water from soils growing sugar cane in the tropics is as important a negative factor in the rainy season as the lack of moisture is in the dry season'.[23] Deficient aeration of the soil, consequent on excess moisture, adversely affects both root growth and the functioning of the roots. The problem was that while the Dutch had particular claims to know rather a lot about drainage (and about associated issues of salinity, et cetera), they were not in a good position to put that knowledge into practice in the cane fields of early twentieth-century Java. As early as the 1890s, industry experts had visited Hawaii and come back full of admiration for the deep drainage practised there – and equally full of regret that *wisselbouw* made it practically impossible in Java.[24] It was, however, but one of the factors that contributed to an apparently gathering crisis.

That crisis, as we have just seen, had multiple dimensions. Some of them were primarily agrarian in character, while others had a predominantly agricultural complexion. In tandem, during the course of the 1910s they had the potential to force Big Sugar to its knees by undermining the very basis of the agro-industry in the field on which it had come to rely for its international comparative advantage. In the event, however, things in turned out differently. During the course of the decade that followed, Java sugar was able either to circumvent or overcome most of the key difficulties that it faced in the agricultural sector of production. It did so, moreover, largely within the confines of Lilliput. This was just as well, because attempts to 'escape' from Lilliput by moving production into areas of the island where 'village Java' had only a vestigial existence proved both very expensive and doubtfully efficacious. It is to these attempts that we can now turn, before resuming the narrative of developments within the industry as a whole during the 'roaring twenties' and the period of Big Sugar's greatest prosperity.

[23] Humbert 1968:399.

[24] See, for example, Kramers 1896.

Chapter 6

No escape

The HVA and the Djatiroto project

In July 1908, a staunch ally of the Java sugar syndicate took the train to Lumajang, in the 'remote' south-east of Java. The individual concerned was Mozes van Geuns, the editor-in-chief of the *Soerabaiasch Handelsblad*, one of Java's leading colonial newspapers. Van Geuns was enthusiastic about the expansion of the imperial frontier. Two years earlier he had reported from Bali, in the immediate wake of the bloody Dutch conquest of the petty kingdoms on the southern tip of the island.[1] Now he was reporting on empire building of a different, but equally crucial, kind. He was on his way down to swampland some 150 kilometres from his base to view a unique development in the island's sugar industry: the construction of a factory complex far bigger than anything seen in Java hitherto, and built well away from the densely settled countryside that formed the industry's classic location. Van Geuns' purpose in going there accurately reflected the close ties between the *Handelsblad* and Big Sugar, and, in particular, his own reputation in the Indies as 'quite unreservedly a pillar of support […] for European entrepreneurship'. Indeed, defence of the 'sturdy Indies planter [*cultuurman*]' was something of an obsession for him, as was his conviction that 'the wellbeing of the Indies was solely dependent on the success of Western enterprise'.[2] Big Sugar found in him an 'ideal spokesman'.[3] It was no coincidence, therefore, that the reportage of this trip to Lumajang was centred on an enthusiastic advocacy for changes to the colony's labour laws that would (inter alia) assist

1 Mozes van Geuns (1870-1918) born in the Netherlands, where he attended the *Kweekschool* (Teacher Training College), arrived in the Indies in 1897. After a short spell as a school teacher, he moved into journalism. He became *hoofdredacteur* (editor-in-chief) of the *Handelsblad* in 1900, and remained in that position (apart from a leave spent in Holland, September 1908-January 1910) until his retirement in 1915. For an account of his career as a journalist, see Termorshuizen 2001:267-77.

2 Bosma 1997:64; Termorshuizen 2001:270.

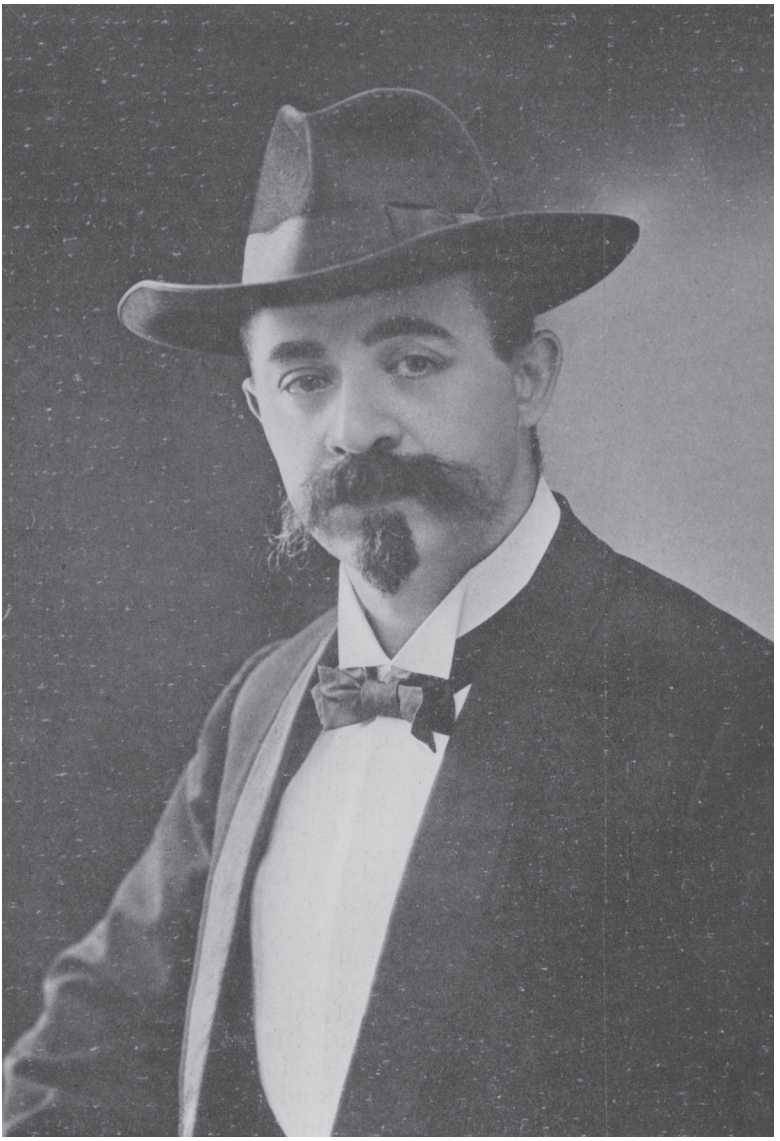
3 Termorshuizen 2001:270-1.

the colonial entrepreneurs there to retain a workforce which, given the paucity of the local population, they had been forced to recruit from far and wide.[4]

In consequence, Van Geuns would not have been alone on his train to Lumajang. Down in the third- class wagons would have been scores of Javanese workers – designated as 'coolies' in colonial parlance. Like Van Geuns, they too were headed for the vast new sugar factory called Djatiroto. The factory took its name from the river that runs alongside it, but otherwise its inspiration was anything but local. It belonged to the Handelsvereeniging 'Amsterdam'. The firm had been an established presence in the Indies for more than a quarter of century, where it had been involved in both the import-export business and in plantation investment, including the ownership of sugar factories. Early in the 1900s, however, the HVA slewed off its commercial arm and became exclusively engaged in agricultural speculations.

At the height of its operations, at the end of the 1920s, the Amsterdam company had extensive investments in both Java sugar and in other plantation crops, both in Java itself and elsewhere in the Indies. Its notional equity capital topped 40 million guilders, while the actual sum invested (as we shall see) was three or four times that amount. The premier colonial banking and business corporation, the NHM – it was also big in the ownership and finance of sugar factories – could draw on twice that amount of paid-up equity, and the oil firm Bataafsche Petroleum Maatschappij (BPM), for example, could call on a massive 300 million guilders.[5] Nonetheless, the HVA was incontrovertibly up there in the major league of Dutch businesses operating in the Indies, and was the owner, inter alia, of some fifteen sugar factories, among them the biggest and newest in the entire colony.

4 Van Geuns 1908. A copy of this pamphlet is in the library of the KITLV, Leiden.
5 Lindblad 1998:77.



Propagandist for the sugar industry: Mozes van Geuns, editor-in-chief of the *Soerabaiasch Handelsblad*, 1909 (*De Hollandsche Revue* 14, 1909, p. 350)

EMULATING CUBA: PETER REINEKE AND THE DJATIROTO PROJECT[6]

Djatiroto was nothing less than Java sugar's attempt to emulate Cuba. Early in the twentieth century, reconstructed with substantial inputs of capital from the United States as well as from domestic sources, the Caribbean island became a paradigm of the industrialized manufacture and corporate management of sugar production. Indeed, by the 1920s, the industry there boasted the largest and technologically most advanced manufacturing units in the world.[7] These Cuban super-factories were vast manufacturing plants working with cane drawn from landholdings covering more than 40,000 or even, in a few cases, 80,000 hectares.[8]

The prospect of the HVA 'doing a Cuba' in southeast Java was clear from the series of articles that Van Geuns wrote for the *Handelsblad*. Indeed, the parallel was quite explicit: 'everything you encounter at Djatiroto is conceived on an American scale. There is no trace to be found here of Dutch small-mindedness'.[9] A later admirer, rather more flattering to his fellow countrymen, viewed the whole enterprise as 'a monument to some of the best qualities of Dutch big business: spirit of enterprise, energy, and a determination to see things through bordering on stubbornness'.[10] Moreover, the New World parallel drawn in Geuns' account was no mere journalistic flourish. Immediately prior to the establishment of Djatiroto, the HVA had sent two of their key people to Cuba to inspect developments there at first hand, while contemporaneously one

6 The information in this and the following paragraphs on the HVA comes from the company's published annual reports (that is, 'Jaarverslagen HVA' – hereafter JV HVA) and from the minutes of the company's board meetings (NHVA). Together, they constitute the bulk of the remaining HVA archief (after what appears to have been the willful destruction of much of it at the hands of the then directors sometime in the 1970s) in the Nationaal Archief (NA), Collectie Handelsvereeninging 'Amsterdam', 2.20.32, inv. nrs. 6-15. For published accounts of the HVA and its sugar operations in particular (in addition to Van Geuns 1908), see Z. 1927:8-41; Claver 2006:262-6; Goedkoop 1990. The 'company histories' are: *Aangeboden door HVA* 1929; Brand, Van den Broek and Goedhart 1979 (a depressingly self-serving and somewhat unreliable volume); and, and by far the most interesting of them, Goedhart 1999:32-49. Goedhart may well have been the director responsible for salvaging some fragments of HVA documentation, now located in Internationaal Insituut voor Sociale Geschiedenis, Amsterdam, Nederlandsch Economisch-Historisch Archief, Bijzondere Collecties 640.

7 On the Cuba industry, in addition to Dye 1998:24-66, see, for example, Moreno Fraginals 1986, and the many contributions to books and learned journals of Brian H. Pollitt; notably in this context, see Pollitt 1984, 1988.

8 Dye 1998:19.

9 Van Geuns 1908:16.

10 Z. 1927:9.

of the company's Java factory managers had visited the American sugar producers in Hawaii.[11] The crucial factor, however, was that the company's CEO, Pieter Reineke, had himself visited Cuba (and Louisiana) and published a short account of his experiences there. Even though in Cuba the twentieth-century regeneration of the industry had scarcely begun at the time of his visit, Reineke had evidently seen enough, both there and in the United States, to set him thinking about how the Java industry might best adapt itself to meet the challenges of the new age of mass production.[12] The solution he came up with was both radical and ambitious.

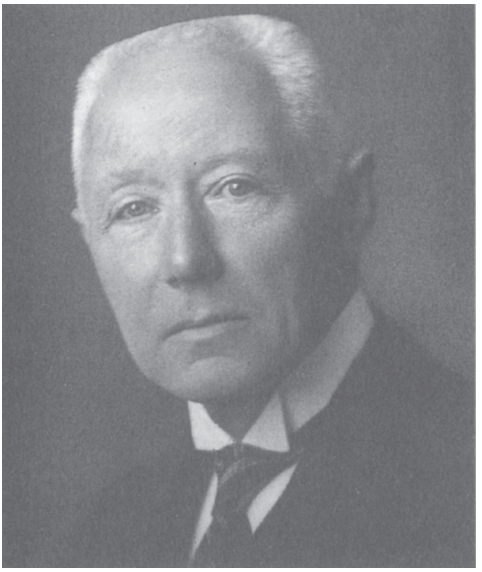
Something of Reineke's personality can probably be gauged from photographs of him. In both relative youth and advanced old age he sported a close-cropped hairstyle that signified a self-conscious adherence to aggressive notions of 'modernity' that perhaps looked to Germany for their inspiration. In Reineke's case, it may have been a style adopted during his student days at the Handelsschule in Osnabruck. Not for nothing was his motto 'to stand still is to regress' (*stilstaan is achteruitgaan*).[13] He was the son of one of the HVA's founders, and was well acquainted with Java. Born in Surabaya, where his expatriate father was in business, the young Reineke was subsequently educated in Europe. Scarcely out of his teens, he returned to the colony in 1891 in the employ of his father's company. After that, his rise was rapid. Parental influence presumably helped account for his promotion to the post of the HVA's Surabaya-based chief representative in the Indies, but it must have been his personal dynamism and abilities that explained the board's decision to appoint him, while still in his mid-twenties, to the position of managing director of the company following the sudden death of his father in August 1895.[14]

11 Notulen bestuursvergaderingen, 1-8-1907/335, in: NA, HVA, 2.20.32, inv. nr. 1.

12 Goedhart 1999:33, 37. Reineke outlined his experiences in Reineke 1901.

13 According to the *voorzitter* of the HVA board (on the occasion of the firm's 75th anniversary); see Notulen bestuursvergaderingen, 8-1-1954/986, in: NA, HVA, 2.20.32, inv. nr. 8.

14 Pieter Reineke was born in Java (17-7-1869) and died in Holland (17-2-1948). For an informative biographical sketch, see Goedhart 1999:336-8. His father, Hendrik Reineke (1843-1895), was involved in business in both Surabaya and Amsterdam, inter alia in the firm of Van Beek, Reineke & Co, which was one of the businesses dissolved into the HVA at its foundation in 1879. For Reineke *père* and the establishment of the HVA in 1879, see Claver 2006:82-9. Ill health forced him off the board at the end of 1933, but he had returned by 1938, and finally stepped down in 1947. See Jaarverslag HVA 1933, 1938; Goedhart 1999:337. Goedhart's is the only book – one that has enjoyed a rather small circulation – to give Reineke any close attention. He was one of the company's lesser 'large' shareholders: in 1916 he held 100 of the 2,054 shares in the company held by the HVA's management and board – this meant that (at 500 guilders per share) his stake in the HVA's equity capital of 15 million guilders amounted to a relatively modest 50,000 guilders ('Afschrift proces-verbaal der buitengewone algemeene vergadering van aandeelhouders', 28-6-1916, in: NA, HVA, 2.20.32, inv. nr. 13).



The driving force behind the HVA: Pieter Reineke (1869-1948) (Goedhart 1999:115)

The appointment took him permanently back to the Netherlands, but he kept up very close ties with his birthplace. Indeed, it was not long before he was visiting the colony on an almost annual basis, in order to supervise developments at Djatiroto – very much his brainchild – and negotiate at first hand with Indies officials to make the necessary arrangements for acquiring land and getting access to water. Back in Holland, Reineke was said to have run the HVA 'with a firm, indeed iron hand' (met vaste, ja ijzeren hand),[15] and the impact of his uncompromising personality reached deep into the Indies. During the early years of the Djatiroto venture itself, the HVA got through five factory *administrateurs* in as many years.[16] Though it rather looks as if he was forced out of the chief executive's position in 1913, he remained on the board and con-

[15] See the remarks of the chairman of the board, C.H. van Tienhoven, on the occasion of Reineke's retirement from the position of *directeur* in November 1913 ('Afschrift proces-verbaal der buitengewone algemeene vergadering van aandeelhouders', 1-11-1913, [unpaginated], in: NA, HVA, 2.20.32, inv. nr. 13).

[16] See 'Djatiroto' in 'Klapper op de Notulen HVA', Lett D., in: NA, HVA, 2.20.32, inv. nr. 10.

tinued to be a power behind the company for another decade or more. It said a great deal that the HVA's telegraphic address in Holland was 'Reineke Amsterdam'.

But the phrase 'doing a Cuba' did not only refer to the sheer size and ambition of Reineke's schemes; it was also a matter of location. The massive expansion of the Cuba industry that took place in the first three decades of the twentieth century was concentrated in relatively sparsely populated and sparsely cultivated provinces in the east of the island, where the industry could operate in a fashion largely untrammelled by the need to accommodate a highly evolved, deep-rooted rural social and economic order.[17] There were important parallels here with Djatiroto. Taking advantage of the commencement of major state-financed drainage and irrigation schemes in the area,[18] Reineke set about creating a huge factory and plantation complex in what was officially designated as 'waste-land'. Indeed, it was one of his company's proud boasts that

The heart of a magnificent obsession: The HVA's Djatiroto factory complex, circa 1925 (KITLV 18232)

17 See, for example, Pollitt 1984:5-6.

18 *Koloniaal verslag* 1909: Bijlage S/III, 5-6. For late colonial irrigation schemes in Java in general, see Ravesteijn 1997.

they had transformed desolate swamp and jungle – and the habitat of tigers – into one of the most up-to-date and extensive agro-industrial installations anywhere in Asia.[19]

An interwar map of the enterprise makes the point quite unambiguously. It shows an industrial complex of factory and plantation that existed in almost complete isolation from the pattern of dense rural settlement that constituted the normal milieu of the Java sugar factory.

Freed from the trammels of village Java: Djatiroto surrounded by (nearly) open country side (*Atlas tropisch Nederland* 1938: 17d)

Within this context, Reineke and his associates even mooted plans to exploit the unique agrarian environment around their new factory to secure a radical departure from existing cane-growing practices in Java. They projected (though did not achieve) a near-continuous, all-year-round planting of cane, and a consequent expansion of the manufacturing campaign to ten months each year – rather than the usual six. They

[19] Van Geuns 1908:3. On tigers, see Boomgaard 2001.

hoped thereby to ensure that very expensive machinery – and highly paid expatriate staff – was not left lying idle for half the year.[20] Here, the inspiration may not have been Cuba so much as Hawaii, where at least some of the American-owned factories, with which HVA executives would have been familiar, ran a campaign that lasted ten months or more.[21]

A NARRATIVE OF MODERNITY

Djatiroto was a major landmark in the history of Java sugar. Equally, however, Reineke's venture belonged to a meta-narrative of modernity and modernism that had a relatively global reach. In the setting of Empire, it was a narrative designed to validate and legitimate the imperial project – a characteristic to which Suzanne Moon has drawn our attention in the context of the history of applied technology in the early twentieth-century Netherlands Indies in general. There were even echoes in Reineke's personal style of what Moon refers to as 'high modernist bullying run amok'.[22]

In part, but only in part, modernity at Djatiroto had to do with the sheer size of the operation. Everything at the site, Van Geuns impressed upon readers of the *Handelsblad*, was on the grandest scale: a factory building 160 metres long and 57 metres wide, with a sister factory projected immediately adjacent; a manufacturing compound covering some 56 hectares; and a servicing rail network extending nearly 270 kilometres, worked by no less than 40 locomotives pulling around 2,000 cane trucks.

So the list went on. The area of land engrossed by the entire operation was huge: in contrast to the 650 hectares or so of cane planted annually by the average Java sugar factory, by 1913 Djatiroto's plantations encompassed some 5,000 hectares – and a decade later (by which time the original factory had indeed been joined by its twin) amounted to over 7,000 hectares.

Projected output was to match. Until the building of Djatiroto, the biggest sugar factory in Java was the NHM's Nieuw Tersana, located in the coastal region of Cirebon Residency in West Java and formed

[20] Jaarverslag HVA 1909: 8-9.
[21] See, for example, Koningsberger 1929:134.
[22] Moon 2007:4-5.

Getting the cane from plantation to factory: The railway marshalling yard at Djatiroto, circa 1915 (KITLV 18324)

from the piecemeal amalgamation of a number of adjacent and long-established enterprises. However, while Nieuw Tersana's annual production early in the twentieth century amounted to around 20,000 MT, circa 1910 the HVA were reckoning on producing almost 50,000 MT at Djatiroto – and that was early days![23]

Yet there was more to modernity than size alone: issues of cleanliness, health and hygiene were also high on the modernist agenda. During the opening decades of the twentieth century, a discourse of this kind – focused on 'the medical production of colonial bodies and colonial space' – developed in the Netherlands Indies just as it did in other parts of the colonized 'Third World'. Hygiene came to be a personal and political mission.[24] The Java industry was far from immune to this trend. As early as 1914, for instance, delegates to a conference organized by the syndicate in Surabaya had been regaled by a speech

[23] Van Geuns 1908:1-6; Notulen bestuursvergadering, 1-8-1913/418, in: NA, HVA, 2.20.32, inv. nr. 2; 'Enkele notities inzake der suikerondernemingen Djatiroto, Semboro, Goenoengsari en Bedadoeng', [1939], in: IISG, NEHA, Bijzondere Collecties 640/A 3 (a).

[24] Bashford 2004:2-4.

Inspecting the plantation by railcar, Djatiroto, 1931 (KITLV 25197)

from a Dr. H. Koppeschaar on the theme of 'Fabrieks-Hygiene'.[25] In addressing the assembled sugar-men (it seems improbable that there were any women present), Koppeschaar was careful to ascribe a central role to 'matters of hygiene' (and in particular the form taken by their housing) in ensuring the bodily well-being 'of the European'.[26] It was not only 'the European', however, who was the object of concern. More generally, and in very much the same context, it was contemporaneously asserted that 'we are now in the position in the tropics to take in hand and control the health of an entire community'.[27]

In the case of Djatiroto, discourse of this kind was integral to that imposition of West over East that was critical to how modernity was conceived there. It was 'clean' electricity (rather than oil or gas) that was used to light both the residential quarters and the entire factory compound. Housing for the factory's European personnel was explicitly

[25] In 1902, Koppeschaar was the civil physican in Pekalongan (Hesselink 2011:289).

[26] Quoted in Van Moll and Lugten 1916:9-10.

[27] Speech of W.A. Keunen at the Indisch Genootschap circa 1915, as quoted in Van Moll and Lugten 1916:12.

'airy and hygienic', built on brick pillars 'from a sanitary point of view'. Mindful, no doubt, of the danger of disease in this former swamp land, the HVA were also at pains to bring clean drinking water – indeed, not just clean but 'pure' (*zuiver*) – to the entire complex.[28] Imperial water was presumably matched by imperial plumbing, and although reference to the latter is surprisingly absent in descriptions of Djatiroto, there can be little doubt that, more generally, notions of bodily and personal hygiene extended from concern about life-threatening contagions to the most detailed enquiries into toilet habits. It has been reported, for example, that roughly contemporaneously one keen American missionary of hygiene in neighbouring Luzon was so concerned on this score that he firmly instructed 'the local Rockefeller emissary […] to modify the [toilet] bowl design to make it impossible to sit on except in the desired position'.[29]

The HVA likewise made a point of emphasizing that expert medical attention was on hand. In the industry at large, the pioneering initiative had been taken a decade earlier by the indefatigable Van Musschenbroek, *administrateur* extraordinaire of the Tjomal sugar factory, who had created a medical centre for a group of factories in 'his' part of the sugar belt that ran along Java's north coast. At remote Djatiroto, the HVA trumpeted the existence of a hospital on site with a European doctor to care for the 'natives' as well as for the forty to fifty European personnel.[30] Rather less publicity was given to the fact that around 40 per cent of its running costs were met by the Indies government, and that when the company doctor re-located he was not replaced; instead, the local European medical man from the nearby town of Lumajang was placed on a retainer. Nonetheless, albeit somewhat compromised, the association of modernity with health and hygiene remained a potent one.

It was not only in terms of hygiene, however, that the Djatiroto compound existed in isolation from its eastern surroundings. Indeed, in his series of articles in the *Handelsblad*, Geuns professed himself struck by the Dutch-ness of it all. The European residential quarter reminded

[28] Van Geuns 1908:5-12; [Anon], 'De suikeronderneming Djatiroto', Bijvoegsel behoorende bij *De Indische Mercuur*, 20-6-1909, no. 26 [unpaginated]. A copy of this short article is to be found in the library of the KITLV in Leiden.

[29] Anderson 1995:641, 2002:687; Dutton, Seth and Gandhi 2002.

[30] The hospital was reckoned to cost around 20,000 guilders a year to run, and the Indies Government provided a subsidy of around 8,000 guilders (Notulen bestuursvergaderingen, 5-9-1913/419, in: NA, HVA, 2.20.32, inv. nr. 2). For Van Musschenbroek's pioneering work on the north coast of Central Java circa 1900, see Van Moll and Lugten 1916:12.

him of a 'friendly Dutch village street', and even the humbler quarters for several thousand 'native' workers (initially they were no more than sheds, or *loodsen*) were not immune from such comparisons. They were complete with their own '*warong straat*', and of an evening, the writer suggested, it might be thought of (in homage to the main shopping street of Amsterdam) as the 'Kalverstraat of Djatiroto'. Unlike its metropolitan counterpart, however, its shopkeepers included 'John Chinaman' and his 'energetic counterpart from Bombay'.[31]

At the heart of Djatiroto's claim to modernity, nonetheless, was the technological superiority of the factory itself. No expense had been spared. According to Reineke, by 1910 some 10 million guilders had been spent on the entire operation, a sum that amounted to approximately one-third of the HVA's total investment in the Indies at that date.[32] By way of comparison, at around the same time a new 'state-of-the-art' factory, built by rival NHM on the north coast of Central Java, had cost less than 3 million guilders.[33] Djatiroto's inventory of machinery was imported from some of the best addresses in Europe: Germany (Hallsche Machine Fabriek), Holland (Stork) and Scotland (the Glasgow firms Mirrlees Watson and Pott, Cassels & Williamson).[34]

In line with this, the factory was the first in the colony to employ electricity throughout (except in the grinding mills and centrifuges). Indeed, Java had seen nothing quite like it: it was, to adopt a later description of the HVA's entire production complex in and around Djatiroto, 'the most modern and most rationally set-up sugar enterprise' in the entire colony.[35]

This in itself was potent language; but 'rationality' was only part of it. Viewing the whole enterprise in its fully expanded form almost two decades later, the neo-fascist Indies journalist H.C. Zentgraaff lauded it less for its economic rationality than for its heroic 'pioneering' character of what it represented. Djatiroto, he exulted, was a 'fantastic and captivat-

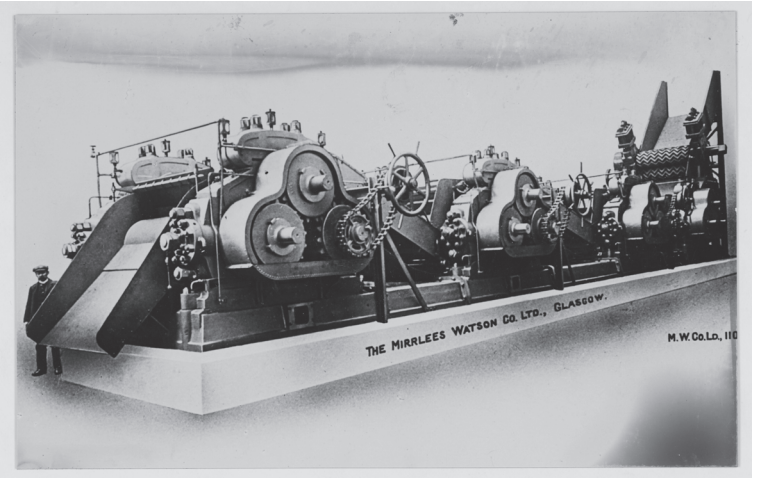
31 Van Geuns 1908:5-12.

32 Notulen bestuursvergaderingen, 22-10-1910/381, in: NA, HVA, 2.20.32, inv. nr. 1; and see JV HVA 1906:5-7 and 1919:5 (which lists 'gestort kapitaal' 1879-1919).

33 Soemberhardjo, completed in 1913, was budgeted to cost 2,000,000 guilders and ended up costing 2,700,000 guilders. See 'Rapport…bezoek aan Soemberhardjo van 29-31 Juni 1913', NA, NHM, 2.20.01, inv. nr. 3120 (dossier 559).

34 The suppliers are listed in [Anon], 'De suikeronderneming Djatiroto'. In Indonesia, the Surabaya industrial workshop (*machinefabriek*) Dapoean had also been involved in providing equipment, though its role was a minor one in comparison with that of overseas suppliers.

35 'Enkele notities inzake der suikeronderneмingen Djatiroto, Semboro, Goenoengsari en Bedadoeng', [1939], in: IISG, NEHA, Bijzondere Collecties 640/A 3 (a).



A cane crusher from one of the best addresses in Europe (KITLV 18321)

ing display of iron and steel that seems to have taken on the qualities of a living, pulsing organism' (wonderlijk en boeiend spel van ijzer en staal dat leven schijnt te hebben gekregen als de onderdeelen van een zwoegend organisme).[36] Such modernity, loudly trumpeted, had a curious and more than merely incidental consequence. The photographs of the new installation – and there were many such – were almost totally devoid of people. Even the photographs of European-staff housing are devoid of any sign of actual habitation, and the thousands of 'native' workers make scarcely any appearance at all.[37] As the Dutch sociologist Frans Hüsken remarked in the kindred context of celebrations of technology in the realm of late colonial irrigation schemes: 'the human component is virtually absent […]. It seems as if the modern colony consisted only of concrete and machinery […].'[38]

36 Z. 1927:38; Drooglever 1999.

37 See the contemporary photographs illustrating [Anon], 'De Suikeronderneming Djatiroto'. The many illustrations in *Aangeboden door HVA* (1929) have similar characteristics.

38 Ravesteijn and Kop 2007:456. The absence of people was not invariable, of course. In a stimulating essay on the inner life of the Java sugar factory, for instance, John Pemberton (2009) bases his argument on many photographs that do indeed show human beings (in this case Javanese workers) alongside the machines that they operated. It is noteworthy, however, that these images are from a (rare) factory owned by a Javanese aristocrat, were preserved as part of an album in his family's private archives and were clearly not intended for the kind of 'colonial' circulation enjoyed by the great bulk of the photographs alluded to in the present text.

MODERNITY PUT TO THE TEST: DJATIROTO IN TROUBLE

There would be a neat symmetry in recording that the HVA's subsequent difficulties at Djatiroto stemmed from precisely that human component that 'modernity' appeared to have lost from its sights. In fact, the situation was more complex than that. To be sure, the fallible human component was indeed there: workers were rarely available in the numbers required and proved 'restive' and 'troublesome', while government officials were apt to prove disobliging. On both counts, difficulties surfaced soon enough. Questions were raised in the Dutch parliament about the apparently high death rate among the 'coolies' working on the construction of Djatiroto. The HVA, of course, attempted to refute the 'rumours', but their persistence may well have been one of the reasons why the company had such difficulty in getting labourers to work there – and why they found it so difficult to keep them there once they had arrived.[39]

Having literally distanced itself from the limitations imposed on the Java sugar complex by its enmeshment with peasant agriculture, the HVA experienced similar difficulties in Lumajang to those of their counterparts in the Netherlands Indies' rubber and tobacco plantation districts of Sumatra and other parts of the Indies that lay beyond densely populated Java. Land was available, but labour was not. In seeking to escape the confines of close peasant settlement, the company had also 'escaped' the concomitant ready supply of local labour. Instead, it had to be recruited elsewhere in East and Central Java, and concession rates were granted on the state railways for 'coolies' headed for Djatiroto. However, the Indies government evidently refused to contemplate Geuns' proposal in the *Handelsblad* for some kind of legal sanction against workers who refused to stay.[40] This was awkward. So, too, was the 'recalcitrance' of government officials in matters relating to drainage and irrigation of the land that the HVA needed for cane: in 1910, for example, the company complained of 'opposition in place of cooperation' on this score on the part of local officials.[41] Even a visit to the factory by Governor General A.W.F. Idenburg in 1912 failed to produce results, despite the appar-

39 The company claimed that the reports from its own medical doctor at Djatiroto demonstrated that the allegation was 'unjust' (Notulen bestuursvergaderingen, 5-11-1909/157, in: NA, HVA, 2.20.32, inv. nr. 1).

40 Van Geuns 1908:26-7.

41 Notulen bestuursvergaderingen, 4-11-1910/382, in: NA, HVA, 2.20.32, inv. nr. 1.

ent assurances given to the HVA's on-site representative.[42] Idenburg, moreover, was a supporter of the 'ethical trend' in colonial policy, and probably less than totally sympathetic to the pretensions of Big Sugar.

A sceptical governor general?: Idenburg visits Djatiroto in June 1912 (Brand, Van den Broek and Goedhart 1979:68)

These setbacks at Djatiroto may help account for the angry tone of the HVA's annual reports. For a decade or more, the HVA foamed at its corporate mouth about 'weak government' and about 'taxes that had overstepped the bounds of the economically viable'. By 1918, indeed, the company had taken to denouncing 'revolutionary' elements in the government's newly established – and, in reality, fairly tame – consultative assembly, the Volksraad. Inter alia, it was said to be forcing a 'totally unnecessary' official investigation of industry practices in relation to land rental and labour relations.[43] Even before this, there had been suggestions that laxity on the part of local officials had resulted in the repeated burning of cane by 'disaffected' elements among the peasantry – it sounds as if the company's contention that this was 'wasteland' was being actively contested by the local population – and consequent dis-

[42] Idenburg's visit took place on the 28 June 1912 (Notulen bestuursvergaderingen, 9-8-1912/405, in: NA, HVA, 2.20.32, inv. nr. 2).

[43] JV HVA 1918:11-2; Notulen bestuursvergaderingen, 7-2-1919/493, in: NA, HVA, 2.20.32, inv. nr. 2.

ruption to the campaign schedule.[44] This was fairly standard stuff. More surprising were dark hints about 'bad faith' on the part of key government officials in the Indies. Antipathy was reciprocated. Indeed, matters had reached such a pass by 1919 that the Governor General J.P. van Limburg Stirum (Idenburg's successor) refused even to grant an audience to Reineke when the latter made his first post-war appearance in the Indies.[45] In consequence, Van Limburg Stirum was viewed by the HVA board as 'an example of the danger that a weak government generates under the present circumstances'. Nonetheless, even he was judged to show signs of promise by apparently dispensing with an adviser whom the HVA considered particularly obnoxious.[46]

Nothing daunted, in the following year (1920) the company took advantage of the arrival on the scene of a new and conservative-minded Minister of Colonies, Simon de Graaff, to shift their lobbying to The Hague. Board members also 'spoke' with De Graaff's nominee, the newly appointed Governor General Dirk Fock, before the latter sailed for Java near the end of that same year.[47] Even so, from the HVA'a standpoint, there was no immediate happy outcome. Two years later, directors were still complaining that 'the government listens too much to the few radical members in the Volksraad, and fails to seek sufficient support among the other parties'.[48]

It meant something, in this context, that one of the hard men of the Dutch political right, Hendrik Colijn, was on the board of the HVA for

44 JV HVA 1911:8. In that year, there were 134 cane fires at Djatiroto, effecting over 500 hectares of cane, of which some 66 hectares. were a total write-off. The company claimed that 'kan de oorzaak der branden alleen worden toegeschreven aan baldadigheid, moedwil, welke het Bestuur [...] niet heeft kunnen bedwingen'. The BB appointed 120 *oppassers* paid for by the HVA, but the HVA reckoned that the burnings would only stop 'indien het Bestuur de bevolking weet te doen begrijpen, dat het zijn vaste wil is, dat aan de rietbranden […] een eind komt'.

45 For example, Notulen bestuursvergaderingen, 5-11-1920/615, in: NA, HVA, 2.20.32, inv. nr. 3.

46 Notulen bestuursvergaderingen, 5-1-1920/605, in: NA, Handelsvereniging Amsterdam, 2.20.32, inv. nr. 3. The official concerned was G.A.J. Hazeu, the Indies government's advisor for native affairs. Hazeu resigned his position and returned to Holland as a result of the impact of a torrent of criticism and abuse from both European civil servants and the Indies press regarding the 'revelations' about 'terrorist' cells within the Sarekat Islam movement, of which he had been an enthusiastic supporter (Van den Doel 1994:379-82; De Graaff and Locher-Scholten 2007:243-6). Van Limburg Stirum had incurred the enmity of the sugar industry in March 1918, with a proposal for a compulsory reduction in the area planted to sugar throughout Java, so as to increase the production of rice, which was in short supply (De Graaff and Locher-Scholten 2007:238-9). Significantly, however, the authors observe that 'Van Limburg Stirum was veel minder "rood" dan zijn Europese tegenstanders onder ondernemers en BB-ambtenaren meenden of vreesden' (De Graaff and Locher-Scholten 2007:226).

47 JV HVA 1919:12 and 1920:12.

48 Notulen bestuursvergaderingen, 1-9-1922/628, in: NA, HVA, 2.20.32, inv. nr. 3.

much of the 1920s. Colijn was the man whose cropped hair underlined a mental outlook – as well as physical appearance – that had distinct affinities with that of Pieter Reineke. A former officer in the Dutch army fighting in Aceh, a one-time Minister of War, *directeur* of the major Dutch oil company Bataafsche Petroleum Maatschappij and later associated with Royal Dutch Shell, Colijn subsequently enjoyed a prominent political career. During the interwar decades, he was several times Prime Minister (for the first time in 1925-1926) and a notoriously reactionary Minister of Colonies. As a (potential) Dutch 'strongman', he became hopelessly compromised with the Nazis after the fall of Holland in May 1940, and was perhaps fortunate to have died – in Germany – before the war ended.[49]

It was entirely characteristic of Colijn's presence at HVA board meetings that he was to be found fulminating about 'the real problem' facing the company in the Indies: it was the silly ideas with which the heads of young aspirants to posts in the colonial bureaucracy were filled by (unnamed) professors at the University of Leiden. He clearly regretted that the individuals concerned could not be dismissed, and suggested that the solution was to be found in the establishment of an alternative institution for training Indies civil servants. With a little help from oil company interests in particular (unlike their sugar counterparts, they had money to burn), this is exactly what happened – at the rival University of Utrecht.[50]

Yet, despite this finger pointing, the company's board minutes – if not their published annual reports – tell a somewhat different story. Difficulties in getting and keeping workers were certainly a problem for the company, as was the reluctance of officials in Java to dance to their every tune. Even so, 'modernity' as represented at Djatiroto had its own, inherent problems. For one thing, the project was a gamble in purely agricultural and horticultural terms. It apparently took a visit in 1911 from the director of the industry's Pasuruan Research Institute – the leading such institute in the world – to alert the company to the purely agricultural constraints on growing cane in a former swamp. The HVA was

49 For a brief (and sympathetic) outline of his career, see Puchinger 1985. For Colijn's early career in oil (and a candid assessment of his deeply unpleasant character), see Jonker and Luiten van Zanden 2007:154.

50 Notulen bestuursvergaderingen,13-9-1923/650, in: NA, HVA, 2.20.32, inv. nr. 3. In the 1930s, Colijn was also close to the management of the NHM (Taselaar 1998:379), which might help account for the extreme anti-nationalist polemic that characterized the company's annual reports from that period.

warned against having too high expectations, at least in the early years of the enterprise, and advised to restrict the area under cane to around 50 per cent of their projected estate if they wanted to ensure reasonable plantation yields. The company's experience with cane agriculture in Kediri, where the bulk of their factories were located, was not to be equated (the HVA was reminded) with the very different agricultural conditions prevailing in Lumajang.

It was typical perhaps of Reineke's style that he countered with the blunt assertion that nobody had ever told them this before.[51] Whoever or whatever was to blame, it took some time for cane yields per hectare to reach acceptable levels. Nor was it simply that cane yields were low: the cane that Djatiroto's plantations did manage to yield also proved to have a low sugar content. Crucially, it was not until 1917-1918, almost a decade after the factory has opened, that the *rendement* at Djatiroto began to stand comparison with the Java average.[52] All this was, of course, bad for both productivity and profits.

Men (and soil) had indeed failed the machine – but the machine itself had also failed. Reluctant as they were to admit it, by 1913 the HVA board had finally to concede that the high-tech apparatus, installed with such fanfare at the end of the previous decade, was simply not up to the job. In particular, Djatiroto was badly underpowered: the boiler house turbines did not generate enough energy to run the mills – and there was a catalogue of other deficiencies that likewise needed to be rectified. It looks very much as if the basic problem was with the American-Cuban model of which Reineke had been such a staunch advocate. The 'American' system of manufacture focused on efficiencies in the grinding of cane, through the use of heavy and super-large mills. The Java producers, on the other hand, were greatly influenced by practice in the German beet sugar industry, where the very different requirements of the raw material had led to a concentration on the chemistry and technology by which juice was converted into sugar.[53] In attempting to fuse the American and German systems of manufacture, it appears that Reineke and his German technical advisor, Georg Fr. Hausbrand, had

51 For this and the report of the visit to Djatiroto of Ph. van Harreveld, in the company of the Indies government's Directeur van Landbouw (Director of Agriculture), H.J. Lovink (Notulen bestuursvergaderingen, 4-4-1913/413, in: NA, HVA, 2.20.32, inv. nr. 2).

52 The relevant data are in Z. 1927:12.

53 See Goedhart (1999:45-6), who also notes that the HVA never again attempted to build a factory as massive as Djatiroto (1).

badly miscalculated the motive power requirements of the American-style cane-grinding apparatus which they had installed. In short, things had gone badly wrong at the mechanical heart of the entire operation. It was 'this disappointment, of all the disappointments', as Reineke remarked to the board, 'that was the most grievous'.[54]

Nonetheless, the most immediate disappointments were financial. During its first three years of operation, the Djatiroto venture consistently ran at a loss of more than a million guilders annually, and matters only began to improve very slowly thereafter.[55] This was a blow for Reineke in particular, who evidently found himself staring down his colleagues on the board with a degree of chutzpah only available to the founder's son. Presumably, it helped his case that he was able to cite a general impression (largely correct, if the example of the Poerworedjo factory discussed earlier in the book was anything to go by) that few of the new factories built in the colony around this time appear to have answered to expectations. None of them, it was said, were paying concerns, and all of them were running at a loss.[56]

A MODERNIST PROJECT DIGS ITSELF INTO A HOLE

Nonetheless, in regard to its vision of a sugar industry free of the trammels of peasant agriculture, the HVA stuck to its guns. To be sure, it was in Kediri, where it was as enmeshed with the peasantry as surely as were any of its competitors, that the HVA made its last, gambler's throw on the very eve of the interwar depression. This was Koenir, opened in 1930 in a no-expense-spared mode, including a massive, triple-span steel girder bridge linking it to plantations on the opposite bank, in the southern sector of the Brantas river valley. It was the most technologically sophisticated sugar factory ever built in colonial Java, and it turned out to be the last. Destined to operate for just two years, before the collapse of the Java industry's overseas markets forced its closure, it was an aberrant

54 Notulen bestuursvergaderingen, 2-2-1912/398 and 3-1-1913/410, in: NA, HVA, 2.20.32, inv. nr. 2.

55 Claver 2006:265. Losses amounted to an estimated 1,100,000 guilders in 1910 (NHVA 30-12-1910/384), 1,038,000 guilders in 1911 (Notulen bestuursvergaderingen, 1-12-1911/396, in: NA, HVA, 2.20.32, inv. nr. 1) and 1,100,000 guilders in 1912 (Notulen bestuursvergaderingen, 7-2-1913/411, in: NA, HVA, 2.20.32, inv. nr. 2). Only in 1913 did they drop to around 500,000 guilders (Notulen bestuursvergaderingen, 3-1-1914/426, in: NA, HVA, 2.20.32, inv. nr. 2).

56 Notulen bestuursvergaderingen, 24-2-1916/455, in: NA, HVA, 2.20.32, inv. nr. 2.

venture in a number of senses. Not least, it was a solitary departure from the HVA's dominant strategy, which the company continued to pursue in the 'remote' far south-east of the island in the area where they had already built Djatiroto. It was there, rather than in Kediri, that the HVA lavished the bulk of its investment, estimated in the late 1920s at around 60 million guilders.[57]

First off, the HVA built a smaller, sister factory there, immediately adjacent to what now became Djatiroto 'number one' – and then went on to construct three more massive, state-of-the-art operations in the equally sparsely populated districts immediately to its south and east. The entire complex – the two Djatiroto factories, Semboro, Goenoengsari and Bedadoeng – had been completed by the end of 1928, and potentially put the HVA in a position to out-produce all its competitors. Indeed, by the end of the 1920s, the HVA had come to own more factories than any other 'sugar' company, and engrossed around 14 per cent of the total area planted to 'factory' cane anywhere on the island. The Djatiroto complex itself had been designed to crush the cane from a total of nearly 17,000 hectares of plantation, with a projected output in the region of 165,000 MT of sugar per year. Something of the ambitiousness of the plan can be gauged from the fact that in 1926, when work on building the expanded complex began in earnest, this amounted to around 10 per cent of Java's total annual sugar export. By 1930, Djatiroto and the adjoining, interlinked factories had nearly 12,5000 hectares under cane and produced around 150,000 MT of sugar. By way of comparison, the operation that most nearly approached it in size – the Poerworedjo factory in the Central Java residency of Kedu – engrossed no more than 2,556 hectares.[58] Elsewhere, on the north coast of West Java, the NHM's Nieuw Tersana – destined by the mid-twentieth century, in the wake of the interwar depression, to become the single largest sugar manufacturing operation in Java – in 1929-1930 planted 'only' 2,500 hectares with cane. Contemporaneously, most Java factories made do with less than 1,000 hectares. The HVA's operations in and around Djatiroto constituted, in short, not only a singular modernist project, but also an unprec-

57 Data in this paragraph from Z. 1927:11; 'Enkele notities inzake der suikerondernemingen Djatiroto, Semboro, Goenoengsari en Bedadoeng', [1939], in: IISG, NEHA, Bijzondere Collecties 640/A 3 (a); Prinsen Geerligs 1927:1189-91. Output from the whole complex in 1931, the last year in which all five factories operated, was 150,000 MT.

58 Data from Table 3, 'Overzicht der suikerfabrieken… Oogstjaar 1930', *AS* 38 (1930) 1, pp. 191-2.

edented concentration of agro-industry that had no equal elsewhere in the colony. Large rubber, tobacco, tea and palm oil enterprises elsewhere in the Netherlands Indies perhaps engrossed more land, but none did so in conjunction with an investment in manufacturing infrastructure on the scale of the HVA's investment in the far south-east of Java. Indeed, given the ambitiousness of the entire Djatiroto complex, it might be suspected that the company's directors planned either to bankrupt the rest of the industry, or be themselves bankrupted in the process. As it was, they came near to doing both.

In terms of productivity and profits at Djatiroto, it would appear that the entire complex left much to be desired well before the catastrophe of 1931. At the end of the 1920s, productivity was consistently far below the Java average as measured in terms of cane-per-hectare, sugar-per-hectare and *rendement*. In 1930, for example, when the Java sugar yields averaged nearly 148 quintals per hectare of cane, the figure for Djatiroto and adjacent factories was only 126 quintals. Colijn, back on the board at the beginning of the 1930s, pointedly asked for an explanation of what was happening, and was told that (inter alia) the very wet former marshland grew cane with a low sugar content; also, at one of the factories there was a suspicion of poor management. In circumstances that were eerily reminiscent of a similar situation a decade and a half earlier, he was assured that the industry's research institute had been called upon to investigate. Another board member suggested that the worst performing of the factories – Semboro, which had only been opened three years earlier – should be shut down. Presumably more than coincidentally, the factory's manager resigned.[59]

Of course, productivity is not the same thing as profitability, and it may be that costs per unit of sugar produced were significantly lower at Djatiroto than in other major sectors of the industry, thus compensating (in part, at least) for low productivity. The exact figures are elusive, since the relevant data appear not to have survived the wanton destruction of much of the HVA archive that took place in Amsterdam sometime in the 1970s. Even if the operating costs of the Djatiroto complex were indeed significantly lower than those of Java's more conventional sugar factories, however, any 'profit' thus generated has to be set against the huge sum of money that had been sunk in the modernist enterprise. Indeed, it is

59 Notulen bestuursvergaderingen, 5-9-1930/736 and 31-7-1931/747, in: NA, HVA, 2.20.32, inv. nr. 5.

reasonably clear that the HVA was kept afloat, and Reineke, Colijn and their associates saved from bankruptcy, by its score of conventional sugar factories in Kediri's Brantas valley further to the west – 'conventional' in so far as cane cultivation there remained enmeshed with peasant agriculture – and its extensive, non-sugar plantation investments elsewhere, both on Java and on Sumatra.[60] The significance of this dismal outcome for the HVA's ambitious – not to say magnificent – schemes was far-reaching for Java sugar as a whole. Only late in the twentieth century, when large sectors of the industry 'migrated' to Sumatra and elsewhere in the Outer Islands of the Indonesian Republic, did the ideas so eagerly embraced by Reineke and his colleagues come into their own: sugar production divorced from the context of peasant agriculture.

'We assume that big business enterprises are rational and that rationality entails awareness', wrote the American historian David S. Landes, before going on to debunk that notion and to argue that 'much decision-making is guesswork and improvisation. Otherwise, how do these enterprises manage to dig themselves so deep a hole?'[61] As it transpired, the HVA's massive investment took place at the wrong time and in the wrong place. For in 1931, the bottom fell out of the world sugar market, and nearly took the HVA – and the rest of the Java industry – with it. The HVA's massive expansion of its sugar interests in Java had been predicated on highly optimistic assumptions about the further, and potentially limitless, development of markets in East and South Asia – above all in China and India – which had become the mainstay of the entire Java industry in the aftermath of the First World War. By the beginning of the 1930s, however, these assumptions were in tatters. Java sugar's main markets were progressively lost to it, primarily because the economic autarchy associated with government responses to the onset of the interwar depression. It is to this that we can now turn.

60 Claver 2006:266. For a brief account of the HVA in Kediri, see Goedhart 1999:32-5.
61 Landes 1998:148.

Chapter 7

Making the best of it

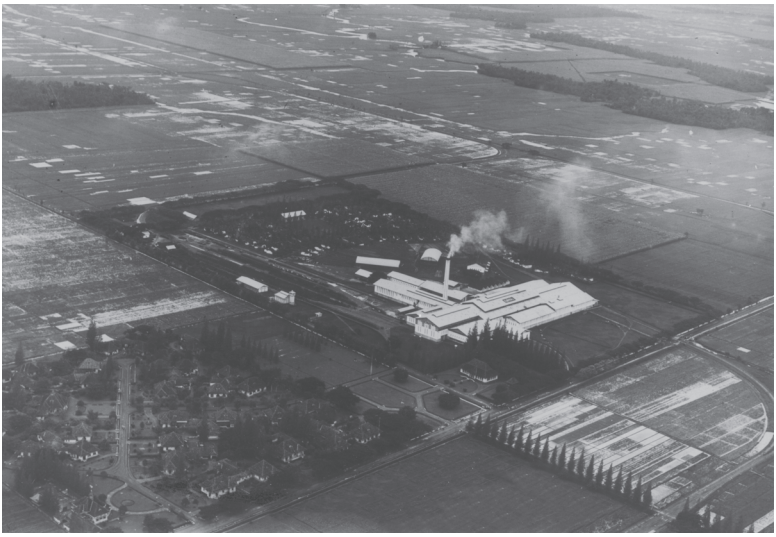
The twenties and the apogee of big sugar

As we have seen, for much of the 1910s colonial Indonesia's sugar industry experienced major obstacles to sustained growth on a number of fronts, both agrarian and agricultural. Taken together, these had the potential to derail the industry through undermining the agro-industry in the field on which it derived its comparative edge in world markets. In fact, developments in the decade that followed took a quite different trajectory: the 1920s saw the industry flourish as never before. After a global hiatus during the First World War, world sugar consumption was again on the rise during the decade that followed and – somewhat surprisingly perhaps – the Indonesian industry was well positioned to take advantage of it. In particular, this was the decade when Java's Big Sugar came to dominate the markets of both East Asia and the Indian subcontinent to an extent that had eluded it earlier in the century.

CRISIS CONTAINED: THE BOOMING TWENTIES

There were several reasons for this. In the short term, developments on the commercial front were critical. A spectacular but brief bull market in sugar at the very beginning of the decade (as detailed in an earlier chapter) gave the industry a much-needed breathing space. The massive injection of cash consequent on this undoubtedly saved the industry from imminent disaster. It also made possible an ambitious building programme that included, as well as the HVA's Djatiroto complex described earlier in this book, the Tjomal Baroe (New Comal) factory on Central Java's north coast.

Nonetheless, the underlying factors in the situation had nothing to do with the commercial bonanza of 1920. Indeed, the international



The new wave of expansion: The Tjomal Baroe sugar factory from the air, 1920s

Relaxing after work at late-colonial Tjomal: The staff swimming pool

price of sugar was thereafter in steady decline. Instead, the crucial developments took place in the sphere of production, where the secular trend was for costs in the industry's agricultural (and manufacturing) sector to fall significantly. Virtually simultaneously plantation yields improved exponentially, after a hiatus of a decade or more, as a result of a veritable revolution in the horticulture of cane. In tandem, these two developments enabled Java sugar to contain or circumvent many of the agricultural and agrarian problems that had beset it during the previous decade. Both took place, however, in a context in which the 'agricultural' obstacles to agro-industry in the field encountered during the previous decade were largely overcome. We can best deal with these first.

FERTILIZER, PUMPS AND RESERVOIRS

On the 'purely' agricultural front (one which, of course, could never be totally divorced from its agrarian context), a number of factors, already embryonic, came fully into play during the 1920s. Inter alia, the industry fairly quickly adapted to the scientific requirements of heavy use of fertilizer, and hence obviated the waste and deleterious consequences of random and overenthusiastic application. From around 1918 onward, for example, the pages of factory managers' annual reports are replete with a rapidly multiplying number of 'field tests for fertilizer use'. What looks superficially like a kind of obsessive 'scientism' was in fact an indicator of a very practical and urgent response to the need to monitor dosage closely and constantly.[1]

Then there was the question of cost. The industry had survived the immediate wartime disruption to the international trade in chemical fertilizer rather well, in part by importing sulphate of ammonia from Japan, the United Kingdom and Australia.[2] By 1919, however, world

[1] The factories were assisted in this by the industry's research institute, which carried out extensive, systematic field tests to gauge the optimal application rates of sulphate of ammonia, in the context of the key variables of soil and climate, that were fundamental to the whole project. In 1914 alone, there were 223 such tests recorded, and by the 1920s this figure had doubled or even trebled (Booberg 1927:434-5).

[2] The Great War brought some disruption of supplies, but imports had resumed toward the end of the war. In 1917 around half of the quantity imported (41,430 MT) came from Japan (15,000 MT) and Australia (5,000 MT) with the balance coming primarily from the United Kingdom (16,000 MT) (*Invoer zwavelzuur ammonia* 1920).

supplies had dwindled and costs, inflated by renewed peace-time demand, sky-rocketed, meaning that the industry was faced with a huge bill for the most vital of its plantation inputs. Since Java was by far the most fertilizer-dependent sector of the international sugar economy, the effects were potentially ruinous. Once again, however, it was the near-contemporaneous, short-lived but massive rise in the world price of sugar during the course of 1920 that saved the industry. By the time that it was over, a big increase in production in the United States and elsewhere initiated a long secular decline in the price of chemical fertilizer itself. The significance of this for the costing of production in Java was considerable. For example, at the NHM's big Modjo-Agoeng factory in East Java (to which we shall return shortly), ZA had accounted for some 20 per cent or more of the total cost of inputs into the agricultural sector in 1921; by 1925, however, the cost was down to around 14 per cent and falling.[3]

At the same time, obstacles to both irrigation and drainage proved to be at least partially surmountable. As early as 1910, the sugar syndicate had paid for a government expert to embark on a year-long, worldwide tour in search of practical solutions to the shortage of irrigation water which the industry experienced during the 'dry', or 'east', monsoon.[4] His subsequent recommendations did not fall on deaf ears. In the two decades that followed, highly elaborate 'technical' irrigation became the norm throughout the Java industry. The proudly photographed installations of the period – aerial photography had emerged during the war, and throughout the prosperous twenties the industry made good use of it, as well as of more conventional camera work – demonstrated how important this all was. Works of high engineering, complete with dams and pumping stations, and often set up in collaboration with the Indies government's own irrigation schemes, helped address the problems inherent in the system of field rotation.[5] These included a network of large reservoirs (*waduk*) that were specifically designed to hold water for cane irrigation during the dry season.[6] One of the most impressive was

3 On the basis of data in Jaarverslagen Modjo-Agoeng, in: NA, NHM, 2.20.01, inv. nrs 9383 and 9384, and from the files on Modjo-Agoeng, in: NA, NHM, 2.20.01, inv. nr. 9212.

4 Meijers 1911.

5 For an extended discussion of irrigation in late colonial Java, see Metzelaar 1946; Ravesteijn 1997. For the linkages between the sugar industry and irrigation, see also J. Alexander and P. Alexander 1978.

6 On *waduk* in general, see Metzelaar 1946:218-27; for a brief discussion of the sugar industry's own *waduk*, see Metzelaar 1946:225-6.

Solving the problems of getting water to the growing cane:
Elaborate irrigation works in the sugar belt along the north coast
of Central Java, 1920s (KITLV 18384, 18376, 18385)

constructed in Central Java's Pekalongan Residency to service a group of factories. Designated as the Blembeng *waduk*, it cost some 2.8 million guilders (around two-thirds of the cost of a decent-sized sugar factory) and was designed to hold 42.5 million cubic metres of water. It promised to greatly improve existing cane field irrigation, and was projected to make it possible to plant another 2,583 hectares of plantation, as well as to make feasible a big increase in peasant's secondary crops.[7]

THE AGRARIAN DIMENSION OF THE INDUSTRY'S RECOVERY: THE CASE OF THE MODJO-AGOENG FACTORY

Developments relating to fertilizer and irrigation played a not insubstantial part in Java sugar's recovery during the course of the 1920s. So, too, did the continuing, constant improvement in the technology of manufacture. Yet, this latter was an essentially incremental process without any dramatic impact on the cost of production. Some key advances – in the form of multiple milling of cane and turbine-driven operation – had actually arrived in the Java industry somewhat earlier in the century and were often in place well before the 1920s. Others – notably the full electrification of factory operations – had only just begun at the very end of the decade. In short, there was no technological or scientific 'revolution' within the factory walls that might be called upon to explain the industry's success in overcoming the multiple crises with which it had been beset during the second decade of the twentieth century.[8] Rather, as was usually the case with the Java industry, it were developments in the sugar fields themselves that held the key to its survival.

We can take as a prime example the developments at NHM's Modjo-Agoeng sugar factory, located in the Brantas delta, to the west of Surabaya.[9] The factory had a moderately long history. Originally known as Soeko Dhono, it was one of the new enterprises set up in Java in the 1880s in the wake of the dismantlement of the *Cultuurstelsel*, under the direction of the Dutch entrepreneur D.J. Jut (see above). By

7 Jaarverslag Factorij Batavia, 1925, pp. 192-3, in: NA, NHM, 2.20.01, inv. nr. 4561.

8 In this respect, Van der Eng's emphasis (1996:216-7) on the role of 'advances in production technology' and on 'growing technical efficiency' during the 1920s in minimizing production costs per unit of product appears to be somewhat misplaced. As is argued here, other factors were substantially more important.

9 For the statistical data of production costs at Modjo Agoeng 1905-1931, see Appendix 3.

the 1920s, now owned by one of Java's biggest combines, the NHM, it had evolved into a middle-sized undertaking with around 770 hectares of peasant farmland rented for cane each year, centred on a factory that had been substantially and recently re-equipped. As such, Modjo-Agoeng was a reasonably typical enterprise, and its history in the 1920s likewise reasonably typical of developments in the industry as a whole.

cheap labour (finally) comes into its own

To begin with, the 1920 sugar price-hike was indeed providential for Modjo-Agoeng. Profits in 1920 amounted to a massive 1,771,000 guilders, up from a ten-year low of a trifling 292 guilders two years earlier in 1918. Nonetheless, its longer-term salvation was dependent on factors of a quite different order. Above all, these related to the increasing availability and consequent cheapness of labour. Throughout the late colonial era (indeed, the situation was only reversed after Independence, in the 1950s) it was labour rather than land that constituted the single-most costly input in Java sugar's agricultural sector. This did not mean that labour was 'expensive' – famously, indeed, this was not the case. Rather, it reflected the huge number of workers employed in the highly elaborate preparation of land and the planting and fertilizing of cane. Any variations in the cost of field labour were therefore of the greatest importance to the viability and profitability of the entire enterprise. It is possible to reconstruct the relevant data from circa 1906 to the onset of the interwar depression using surviving industry reportage.

The overall picture that emerges for the industry as a whole is that of an arc of rising and falling plantation labour costs, anchored at one end around 1910, and at the other at the beginning of the 1930s. To be sure, within that arc, there were substantial local variations, due to there not being one Java but many. At some factories, at least, the years 1913-1914 witnessed a significant but short-term rise in field costs, probably associated with the period of agrarian 'unrest' detailed earlier in this book. Likewise, at some factories the cost of fieldwork remained relatively high until the mid-1920s – or had a temporary spike around that time – whereas at others it began to decline fairly consistently from 1922 onward. Virtually universally, however, the industry experienced an unprecedented – and, in some cases, massive increase – in fieldwork

costs around 1920. Equally universally, toward the close of the twenties these costs had returned to something approaching the levels recorded around 1910.

In the specific case of Modjo-Agoeng, the story begins on the eve of the First World War.[10] At this point, the factory's management found itself paying significantly more for piecework in its cane fields than had been the case for a decade or more (at other NHM factories, the trend appears to have begun somewhat earlier).[11] Indeed, by 1914 per hectare '*bewerkingskosten*' (that is, the expenses incurred in field work) stood at nearly 200 guilders, up from 160 guilders four years earlier. The increase was sufficient to prompt the *administrateur* into offering some explanation; he alluded in particular to the need to increase piecework rates to match those of nearby factories who were competing for 'scarce' labour (in circumstances, though he did not say so, in which the industry throughout the Surabaya region was pushing hard to increase the area under cane). By 1916 and 1917, however, what appeared to have been only a temporary 'difficulty' had apparently subsided, and the rates paid for land preparation (the single-largest labour expense in the agricultural sector) could be lowered because of an increased '*werklust*' (zest for work) in the countryside around Modjo-Agoeng.

As this suggests, the dynamics of the industry's labour supply, both at Modjo-Agoeng and elsewhere, were fairly complex. During the opening decades of the twentieth century, there had prevailed in the industry as a whole a system of informally bonded field labour, recruited, in part at least, by *mandur* employed by the sugar factories. This could prove expensive. One middle- ranking NHM executive, for instance, opined that 'excessive' payments to *mandur* for the fieldwork performed by their recruits was one of the prime reasons why labour costs in the industry had escalated in the years immediately prior to the First World War. It was the *mandur* – people whom he described as in charge of overseeing fieldwork (and presumably bringing the men onto the field) and negotiating *eenheidsprijzen* (piecework rates) with the factory – who benefited from escalating costs, he asserted, rather than the workers. The workers them-

[10] The information that follows in this paragraph (unless otherwise stated) is drawn from the Jaarverslag Modjo-Agoeng, 1906-1932, in: NA, NHM, 2.20.01, inv. nr. 9383.

[11] A calculation made by the NHM's head office circa 1913 showed that for the eleven sugar factories then owned or closely associated with the firm, 'bewerking' costs in the agricultural sector had risen from 127 guilders per *bau* to more than 149 guilders per *bau* between 1907 and 1912, with by far the biggest rise taking place in 1912. See 'Bijlage IV …Bewerking 1907-1912', in: NA, NHM, 2.20.01, inv. nr. 9213.

selves did not gain from the high prices paid for fieldwork, and (he argued) would therefore not be aggrieved (and hence work less effectively) if these were cut back. In the circumstances, he was quite confident that a subsequent reduction in piecework rates in the cane fields had been achieved without any fall in labour productivity.[12] This was 1917, and the congratulatory note turned out to be somewhat premature.

Not least, this resulted from the depredations of the 'Spanish' influenza, which both decimated the workforce available to the industry and distorted the cycle of peasant cropping in ways that further reduced the turnout of sugar labour. By 1918, plantation-sector costs at Modjo-Agoeng were 'considerably higher'; in particular, 'very much more had to be paid' for the heavy work involved in breaking up the ground and digging the trenches in which the cane would later be planted. In the following year, wages had to be raised yet further. Inter alia this was because of competition from neighbouring sugar factories, one of which was said to be paying 'huge prices' (*enorme prijzen*) for fieldwork, and another of which was reported to pay the same rates as Modjo-Agoeng but to require less work in return. In the circumstances, Modjo-Agoeng had recourse to expensive labour brought in from outside its immediate locality (*importvolk*). This was a Java-wide phenomenon; indeed, by the end of the decade, sugar factories throughout Java appear to have been faced with widespread shortages of field labour. Labour scarcity was sufficiently pronounced for *mandur* to be sent hither and thither in search of workers, at the factories' behest and with the factories' cash.[13] The system proved distinctly efficacious, if not trouble-free: it was said by industry sources that 'providing loans gave rise to all sorts of underhand business between the *mandurs* and the [work] people', and that the factories sometimes did not get their money back.[14] Nonetheless, managers congratulated themselves on obtaining the services of 'very good coolie-*mandurs*', who proved adept at bonding large numbers of workers from even some considerable distance away.[15]

[12] [Superintendant] O.T. Muller von Czernicky, 'Eenige aanteekeningen op het Jaarverslag 1917 van de suikeronderneming Poerworedjo', in: NHM, NA, 2.20.01, inv. nr. 8099.

[13] On the need to employ *hulpmandoers* (assistant foremen) without whose efforts it would have been impossible to assemble an adequate workforce for field preparation, see, for example, Jaarverslag Kemantran, 1921, p. 23, in: NA, NHM, 2.20.01, inv. nr. 9209.

[14] Jaarverslag Soemberhardjo, 1922, p. 34, in: NA, NHM, 2.20.01, inv. nr. 9228.

[15] Jaarverslag Ketanggoengan-West, 1921, p. 17, in: NA, NHM, 2.20.01, inv. nr. 9210.

Even so, by 1920 there were clearly other factors impacting on the dynamics of labour recruitment. Some of this had to do with the evolving political economy of the peasant Java in which the industry was enmeshed. According to one of the major sugar companies, for instance, in some parts of the island 'big peasants' (*groot sawah bezitters*, in the terminology of the time), in view of the very high price of rice, had adopted the practice of paying their labourers in cash (*klinkende of papieren munt*) instead of making payments in kind, which had been customary. Since these cash payments failed to keep up with the escalating cost of subsistence foodstuffs, however, the effect was to propel the landless population in the villages in the direction of the factories.[16]

At Modjo-Agoeng itself, by 1922 things were beginning to return to 'normal' and wages started to go down. The secular trend was for field costs to fall because the factory was able to pay less for the performance of the elaborately differentiated sequence of tasks that characterized the industrial work routines of its plantation regime. Not least, as Modjo-Agoeng's management noted with a degree of satisfaction, this was because all the factories in the area had stuck to an agreement to fix a common price for the trench digging that lay at the heart of fieldwork in this part of Java. In the following year, it was a similar story, in so far as 'greater keenness to find employment' (*grootere werkwilligheid*) among the potential workforce enabled further cuts to be made in piecework rates. To be sure, two years later, in 1925, there was an interruption to this happy story when a good rice harvest combined with the debilitating prevalence of malaria in the locality of Modjo-Agoeng to reduce the turnout of labour. Nonetheless, the interruption proved short-lived, so that, by 1931, at this particular factory, the unit costs of field labour (calculated in terms of each hectare of land brought under cane) had returned to levels last seen almost a quarter of a century earlier.[17]

By the close of the 1920s, in short, Java was finally living up to its reputation for cheap and abundant labour. At Modjo-Agoeng as elsewhere throughout the sugar industry, managers had been able to cut labour costs to the bone across all sectors of production.[18] The brute repression

[16] Factorij NHM to Amsterdam, 5-5-1920/230, in: NA, NHM, 2.20.01, inv. nr. 8101.

[17] NA, NHM, 2.20.01, inv. nrs 4945, 7999 file 593.

[18] This fall in the unit costs of labour was also in evidence in the manufacturing sector, where it is, of course, important to be able to establish that they were already underway before the big increase in throughput contingent on the arrival of ultra-high-yielding cane took place late in the 1920s. For example, at Modjo-Agoeng, a *steady* decline in labour costs per quintal of cane in the manufacturing sector

of labour was an undoubted factor. It was something in which the sugar companies received – as had not been the case earlier – the unambiguous support of an increasingly reactionary colonial regime. Through the agency, in particular, of the aptly named field police (*veldpolitie*), equipped with small arms and motor cycles, the state enjoyed an enhanced flexibility of control in the countryside that severely discouraged protest. Operating in units of between twenty and sixty men, by 1930 the new force comprised a total of around 23,350 personnel.[19]

The emphasis on 'law and order' in the countryside may well be one of those standard tropes of 'colonial rule' that merits further investigation. Nonetheless, following the abortive so-called 'communist uprisings' on the island in 1926 it became a pervasive reality, and the field police came into their own. In 1927, for example, in the locality of one particular factory on the north coast of Central Java, a force of sixty of them turned out to suppress a 'disturbance' (*opstootje*) among the peasantry of the surrounding district.[20] Even before that, however, the intimidation and repression of Java's 'native' workforce – the sugar industry included – had become the hallmark of a regime that had abandoned any pretence of maintaining a 'neutral' stance in respect to the disputes between capital and labour that had characterized its policy and practice at the very beginning of the decade.[21]

Yet, repression in the countryside was only part of the story. Underlying the history of labour in the 1920s was a combination of factors that went beyond (and, at the same time, facilitated) crude coercion. With respect to wages and the supply of labour, toward the close of the 1920s, two things were happening that might superficially seem contradictory. The factories – as we have already seen – were able to make significant savings in the

(which included both factory labour per se and the labour involved in cane cutting and cane haulage) set in early in the 1920s and continued through to the end of the decade, during which period per quintal labour costs fell from 1.61 guilders (1922) to 1.03 guilders (1931). The same company's Poerwodadi factory in Madiun Residency exhibited largely similar traits: labour costs in the manufacturing sector likewise began to fall *fairly steadily* from 1923 onward (1.32 guilders per quintal) to 1930 (0.94 guilders per quintal). At neither factory was there a sudden drop in the per quintal costs of labour contemporaneous with – and hence potentially ascribable to – the rapid uptake of POJ 2878 and consequent substantial increase in factory throughput in 1928-1929. See the relevant data in Jaarverslag Modjo-Agoeng, 1920-1931, in: NA, NHM, 2.20.01, inv. nr. 9383; Jaarverslag Poerwodadi, 1920-1931, in: NA, NHM, 2.20.01, inv. nr. 9392. These data and similar data for other NHM factories during the 1930s are also to be found (often in draft form) in: NA, NHM, 2.20.01, inv. nr. 9212.

19 *Politie* 1927, 1932.

20 Jaarverslag Doekoewringin, 1927, p. 36, in: NA, NHM, 2.20.01, inv. nr. 7212.

21 Ingleson 1986:266.

cost of field labour, largely by cutting piecework rates. Far from deterring the flow of labour into the agricultural sector, however, the reduction in wages was paralleled by a greater flow than before of workers who came (from the industry's perspective, at least) of their own accord, rather than as a result of bonding arrangements initiated by industry-paid *mandur*. Many factories were able to cease earlier practices of informally bonding large numbers of their workers, in tandem with the dispatch of recruiting agents into neighbouring districts, or even further afield. Instead, they were increasingly able to rely on a purely 'voluntary' turnout of workers, who – as far as the factory comprehended the dynamics involved – made their own way to the sugar fields and factories. Those whom factory management described as 'free workers' *(vrijwilligers)* now made up the bulk of the field workforce. In 1928, for example, according to the *administrateur* of one large factory on the north coast of Central Java, the workers required for the heavy work of field preparation had turned up 'entirely of their own accord and in droves' (*geheel uit eigen beweging en in massa*).[22]

Several explanations for what was happening – plenty of 'free workers' combined with cuts to piecework rates – might seem at variance with each other. In fact, however, far from being mutually exclusive, they were the consequence of depression conditions in rural Java that set in late in the 1920s. The bare bones of the situation emerge fairly clearly, for example, from the records of the colony's light-railway companies. Dependent for their income not only on freight (much of it, sugar) but also on large numbers of third-class 'native' passengers, they were especially sensitive to fluctuations in the welfare of the Indonesian communities that they serviced. In the heavily 'sugared' region extending westwards along the north coast of Java between Semarang and Cirebon, the company whose lines ran through the area reported on seriously deteriorating rural conditions in the second half of 1929, caused in part by severe drought in the dry season and exacerbated, as far as labour was concerned, by the scaling down of employment on public works.[23] The following year (1930) was significantly worse – and railway business correspondingly terrible. The decline in 'native welfare' had become very pronounced indeed by the year's end. A population that, according to one railway executive, never did more than just keep its head

[22] Jaarverslag Ketanggoengan-West, 1928, p. 34, in: NA, NHM, 2.20.01, inv. nr. 9212.

[23] Jaarverslag Semarang-Cheribon Stroomtram Mij, 1929, pp. 10-1, in: NA, Semarang-Cheribon Stroomtram Maatschappij, 1893-1946, toegangsnummer 2.20.17, inv. nr. 12.

above water, was rapidly going under.[24] The situation was subsequently made worse (as sugar industry sources make quite clear) by the evident determination of the Indies government to collect its 'rightful' revenues, regardless of the extent of rural distress. In 1932, for example, a factory manager reported to his company, from his vantage point on the north coast of Central Java, that taxes were becoming very oppressive, and that a notional reduction of the government's land tax by 10 to 20 per cent had been totally vitiated by a revaluation of land that had left many peasants having to pay more than they had done in the previous year.[25]

Embedded in this gathering economic crisis in the countryside – one that began well in advance of the hard times more commonly associated with the impact of the worldwide interwar depression of the 1930s – were issues related to the price of rice. In so far as locally prevailing rice prices can indeed be gauged from national-level figures, the price of this key subsistence commodity fell fairly steeply toward the very end of the 1920s, something which presumably hurt peasant landholders (who had a surplus to sell), but which ought to have benefited wage labourers (who needed to purchase it). Indeed, some calculations show that because of the falling price of rice, 'real' wages in the countryside were either constant during the decade or were actually rather higher at the end of the decade than they were at its beginning.[26] Be that as it may, it seems

[24] Standard factory wages were said to have fallen from 35 to 25 duit per day (Jaarverslag Semarang-Cheribon Stroomtram Mij, 1930, pp. 11-2, in: NA, Semarang-Cheribon Stroomtram Mij, 2.20.17, inv. nr. 12). The implication that falling prices for foodstuffs reflected a crisis that involved farmers as well as labourers is my own.

[25] Jaarverslag Bandjaratma, 1932, p. 34, in: NA, Cultuur-, Handel- en Industriebank; Koloniale Bank; Cultuurbank NV, 1881-1969, toegangsnummer 2.20.04, inv. nr. 943.

[26] One authority (Van der Eng 1996:216) suggests that in rice equivalents, the average wages at sugar factories remained fairly constant throughout the 1920s. This does not necessarily conflict, of course, with the demonstrable fact that the factories were able to reduce significantly the cost of labour inputs into the plantation sector (guilders per hectare) during the second half of the 1920s, and that this trend was even more pronounced in 1930-1931. For some basic data on 'real wages' in the 1920s, see Dros 1992:30. Dros' calculation (1992:30, Table P) was that the 'index real wage' (taking 1913=100) fluctuated between a low of 87.9 in 1921 and 1926, and a (short-lived) high of 122.9 in 1931 – that is, those sugar workers still in employment in 1931 notionally enjoyed a better 'real' wage than they had done for some years. As Dros' data make clear, however, this applied to factory workers only (and by 1931 the industry had cut back drastically on cane planting for the following year's campaign, so that if the same high 'real wage' prevailed in the agricultural sector, only a much reduced workforce would have been there to 'enjoy' it.) The most authoritative of the problematic calculations of 'global' rice prices in the Indies is to be found in Creutzberg 1978:39, Table 1. Taking 1913=100, the index figure stood at 228.2 in 1921, 145.2 in 1930 and 92.7 in 1931. Creutzberg's data do not reveal, however, a steady drop in rice prices between 1922 and the end of the decade; rather, they suggest that prices dropped rather swiftly early in the decade and remained roughly at that level (with some fluctuations) until the big drop of 1931.

that economic conditions in rural Java were operating in the industry's favour well before the factory closures of 1932. The severe reductions in the area of cane planted in 1931 for the following year's campaign acted to drive down wages even further.

Against this background, it rather looks (the point remains somewhat speculative) as if the industry had succeeded, by the late 1920s, in 'breaking through' to what were in any event the most immiserated elements in the rural working population. The situation, in short, had changed markedly since the early years of the century, when in some parts of Java at least – generalization easily breaks down in the face of the locally particular – work in the sugar fields had been largely the preserve of the 'middling' rather than the poorest elements among the peasantry. This had reportedly been the situation, for instance, at the Tjomal factory in the residency of Tegal, on the north coast of Central Java, where a unique, detailed survey of the locality revealed what would later be termed 'exclusionary' labour arrangements. As a modern authority has observed, 'a substantial share of these jobs [in the sugar fields] was not open to landless villagers, who were probably in greatest need of employment'. Instead, a substantial amount (50 per cent or so) of the work in the sugar fields was 'reserved' for landholders who rented their fields to the factory, while much of the rest of the work was performed by villagers who, though they did not hold arable land, at least had house plots of their own.[27] There is some indication, however, that this situation had changed by the late 1920s, and was to change yet further in the years of industry closure that followed. One writer, for example, emphasizes the sheer destitution of those labourers who turned up to work what fields remained under cane cultivation after the massive factory closures that took place Java-wide after 1931.[28]

opportunity costs and the 'squeeze on cane'

Other trends in the countryside, however, were working against the industry – and these were trends for which the rural depression only brought short-term relief. The industry's labour 'problem' may well have eased. The same could not be said, however, for land. In German-

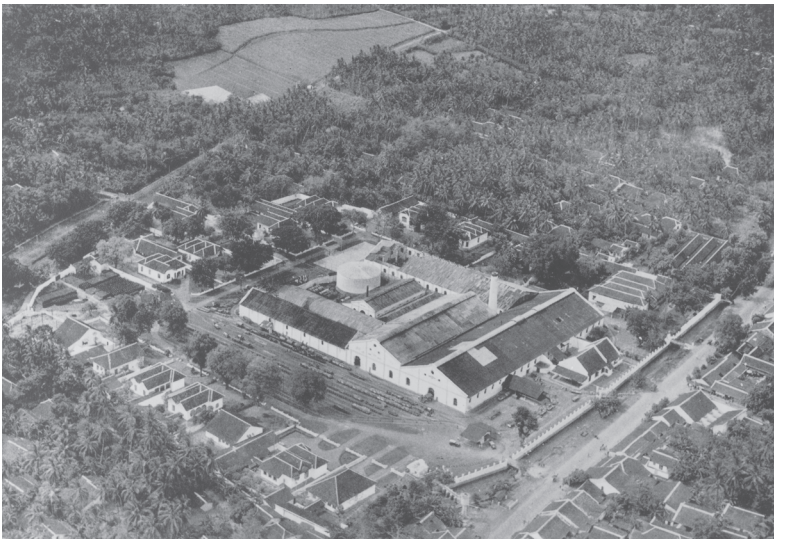
[27] Hüsken 2001:108.
[28] Elson 1984:243-4.

occupied Holland during the Second World War, one of the top managers of the NILM, the once-resplendent Indies plantation company, had time enough on his hands to begin to construct a history of the firm for which he had worked for more than three decades. What he had to say about the issue of access to peasant land for cane growing, both before and after the interwar depression, is highly instructive. His story concerned events at one particular medium-sized sugar factory – Pagongan, near the city of Tegal – on the north coast of Central Java, but there is no reason to suppose that it was in any way exceptional. Sugar production at Pagongan had a long history. Indeed, it dated from sugar-manufacturing ventures established there by Indies-Chinese interests in the 1840s (or earlier), though it had subsequently passed into Dutch hands. The people who ran it, therefore, were hardly newcomers in the area, and were presumably fully conversant with the often unwritten intricacies of industry land-rental in this part of the colony's northern littoral. Yet, if the compiler of the wartime history is to be relied upon, the NILM's local managers found the going anything but easy.

Like many other such factories, Pagongan in the opening two decades of the twentieth century had been successful in lobbying the Indies government to be allowed to extend considerably the area that it rented from the local peasantry for the planting of cane. It did so largely thanks to the way in which, as elsewhere in the region, the government's 'technical' irrigation in the adjacent countryside had brought into existence great swathes of new *sawah*, which Pagongan could also hope to exploit for its own purposes. But that exploitation was far from assured. Although there was notionally enough *sawah* in the area to enable the factory to rent its 'allowance' of 700 hectares, reality was somewhat different: 'the circumstances in which land rental took place cannot be described as favourable […] the enterprise was compelled repeatedly to rent less suitable land […]. The rental of some really good blocks of sawah was always very difficult.'[29]

As was the case with the Java industry as a whole, Pagongan was caught up in what can most conveniently be called the 'squeeze on cane'. Notionally, the squeeze and, closely bound up with it, the opportunity-cost issue (meaning the relative comparative economic advantage accruing from the various uses to which farmland might be put), was a

[29] 'Pagongan' in 'Geschiedenis NILM', circa 1942, in: NA, NV Nederlands-Indische Handelsbank; Nationale Handelsbank NV, 1863-1966, toegangsnummer 2.20.03, inv. nr. 331.



Aerial view of the Pagongan sugar factory north coast Central Java, circa 1925

relatively straightforward matter: it related to the fact that by the early twentieth century, the lowlands of Java were filling up with people (even in those areas that only a decade or so earlier had been relatively sparsely populated) and that this filling-up imposed an inexorable pressure on the amount of useful farmland.[30] As far as the sugar industry was concerned, this pressure was reflected in an escalating competition for fields between the industry's apparently insatiable demand of land and the requirements of peasant farmers, who found the production of rice and other food crops more profitable than the renting of their fields to the sugar factories. The bottom line was that sugar cultivation was carried out on land that (however much expanded by the wonders of technical irrigation) was ultimately in finite supply.

The upshot, both figuratively and literally, had the potential to fence in the agro-industrial plantation. It was here, above all else, that its continuing enmeshment in Lilliput entailed an ostensibly critical obstacle to the perpetuation of the highly advanced, industrial agriculture that formed the backbone of the colonial factories' operations. The 'squeeze

30 For quantification, see Van der Eng 1996:143-6.

on cane' was, of course, a phenomenon that affected other sugar industries elsewhere in the sugar-and-rice regions of twentieth-century Asia. Formosa (Taiwan) was a notable example.[31] For the Java sugar companies, nonetheless, the exceptionally highly developed state of agro-industry made the question of alternative uses of the island's resources of good land particularly threatening.

To be sure, the situation in which the industry found itself was not quite so straightforwardly adverse as it might seem. The rural political economy in which the squeeze on cane operated reflected (as was outlined in an earlier chapter) not simply the pressure of the population on subsistence resources, but also the many disparities of wealth, power and influence that characterized Java's far from homogenous peasantry. Many small farmers were so deeply in debt that the economic rationale pre-supposed by the notion of 'opportunity cost' was, in reality, scarcely existent. The rentals paid by the sugar factories were an ostensible life belt, which overrode any calculation of long-term economic advantage: they provided immediate cash even as they foreclosed on any hope of future solvency. For 'big peasants' the purported opportunity cost was likewise not necessarily quite as straightforward as it seemed. Inter alia, rental monies from the factories might be used to cement their hold over their clients and dependents. Equally, of course, the sugar companies might hope to mobilize the power of the state in ensuring that the cost of rental did not get 'out of control'. The government-decreed minimum rental price might well become the 'acceptable' level for rentals in the particular area to which it applied.

In short, there were a number of factors at work to mitigate the effects of the squeeze on cane. Nonetheless, as the case of the Pagongan sugar factory suggests, this was a far from straightforward or uncontested process. Particularly in areas where notionally subsistence cultivation was in fact becoming increasingly commercialized in response to market opportunities, the sugar companies might well come up against substantial resistance from elements among the peasantry (and their backers) who sought to exploit these opportunities. Evidence from parts of the heavily 'sugared' north-coast region of Central Java, for instance, points unequivocally to the plethora of crops grown for the market by a peasantry that was by no means exclusively engaged in the production of rice for

[31] Chen 1963:325; Gallin 1966:53-4; Williams 1980:239-41.

its own consumption.[32] The upshot was that while the price of labour declined during the course of the 1920s, the price of land climbed.

At the Modjo-Agoeng factory discussed earlier in this chapter – as was the case throughout the industry – the secular trend between 1900 and 1930 was for rental costs to increase by around 100 per cent.[33] The actual history of rentals at this particular factory during the course of the 1920s was subject to some fluctuation, nonetheless, in that they started rather high at the beginning of the decade at sixty-nine guilders per hectare, peaked at ninety-four guilders in 1924 and finished the decade somewhat lower at just over ninety guilders. Presumably, this modest fall had to do with the onset of the same rural recession that (as we have already seen) enabled the factories to cut their labour costs at around the same time. The cost of land rental was to fall very much further during the early-to-mid 1930s. Nonetheless, the long-term trend toward increased land-rentals remained a determining factor in the industry's mid-twentieth-century history.

HORTICULTURE TO THE RESCUE: JAVA'S WONDERCANE

Against this general background of the squeeze on cane, it was developments in horticulture that proved decisive. They enabled the industry to resume, in the course of the 1920s, the growth in field productivity that had stalled around the end of the first decade of the twentieth century – and to achieve in consequence a substantial increase in manufacturing throughput. The discarding of old cane varieties, and the breeding and rapid uptake of new ones, was an essential part of the story. As was the case globally, the choice of cane varieties was a vital part of the Java industry's success. From the 1870s until the close of the century, for example, a widespread switch from the indigenous 'Japara' variety of cane to the altogether more productive (but equally indigenous) 'Black Cirebon'

[32] See, for example, J.J.M.A. Popelier, 'Memorie van Overgave van de residentie Pekalongan', 1931, pp. 32-8, in: NA, Memories van Overgave, 1852-1962, toegangsnummer 2.10.39, inv. nr. 46, which lists, inter alia, maize, cassava, tobacco and kapok as crops regularly grown for the market on a significant scale in parts of this densely populated part of north Central Java.

[33] Jaarverslag NHM Factorij Batavia, 1930, p. 273, in: NA, NHM, 2.20.01, inv. nr. 4564. For a detailed analysis of sugar industry rentals in the late nineteenth and early twentieth century, see Van der Eng 1996:217-24.

was claimed to have resulted in a doubling of plantation yields.[34] The 'new' variety, nonetheless, was highly susceptible to disease, something that by the 1880s threatened to decimate the industry. It was at this the point that nurture came to the rescue of nature. The nation that had perfected the tulip several centuries earlier turned its attention to sugar cane. Needless to say, results were not instantaneous. Nonetheless, the eventual outcome in its Indies colony was a sugar industry that was bedded down in horticultural science to a quite unique degree.

As we have already seen, the role of the industry's research institutes had been fundamental in ensuring the success of the fertilizer revolution. Their remit, however, went well beyond this. Research on the horticulture of cane had been part of their work since the research institutes' inception in the 1880s, and by the second decade of the twentieth century it became critically important. Just as the fertilizer revolution had been the key to greatly improved productivity at the end of the nineteenth century, in the mid-1920s it was the handiwork of the industry's horticulturalists that saved the day. It was the efforts of these experts that lay at the heart of a dramatic rise in plantation yields, a decade after the fertilizer revolution had largely run its course and the whole agro-industrial project at whose centre it stood appeared to have reached the limits of its potential.

Initially, however, the prime role of cane horticulture was to produce disease-resistant varieties, as well as ones suited to the various soil conditions which the industry encountered as the large-scale, late nineteenth-century expansion of the area under cane got under way. The key variety here, dominant in the industry by the early twentieth century, was EK 28, whose great virtue was that it was little susceptible to the dreaded *sereh* disease that had plagued the industry since the 1880s. At the same time, however, it proved significantly prone to root-rot, and hence had only a limited future.[35] Nonetheless, it highlights the extent to which early work on sugar cane in Java was focused primarily on resistance to disease, rather than on sugar yields. Indeed, broadly speaking, it was only after 1914 that new varieties began to have a significant impact on productivity per se. Once they did so, however, the results were spectacular, culminating by the 1920s in the arrival on the scene of Java's *wondercane*. This was the celebrated POJ 2878, its initials representing the

34 Van Deventer 1915:264-6.
35 Van Deventer 1915:285-6.

Proefstation Oost-Java in which it had been created. The new cane had the potential to increase yields per hectare by as much as one third, and in many respects, it was to prove the salvation of the industry.

The speed of its take-up was impressive, reflecting, inter alia, the high level of organization in the agro-industry into which it was introduced. Indeed, by 1929 – a mere four years after its first extensive trials – POJ 2878 accounted for around 95 per cent of all 'factory' cane planted in Java.[36] Much higher plantation yields were not the only advantage accruing to the industry from POJ 2878. Moreover, because it was largely disease-free, the new variety obviated the need for the spatially separate preparation of cane cuttings, or *bibit*, that had come to characterize the Java industry late in the nineteenth century. This resulted in a significant saving in production costs. Whereas at Modjo-Agoeng the provision of *bibit* had generally accounted for 20 per cent or more of total production costs in the agricultural sector, by 1930 it had fallen to as little as 5 per cent.[37]

SALVATION AT A PRICE

Nonetheless, *wondercane* meant salvation at a price. New and high-yielding varieties of cane caused a fresh flush of increased productivity and output at the end of the 1920s. This new spurt of growth, however, was no longer based, as previous ones had been, on factors that gave Java a significant comparative advantage, above all the abundance of its local supply of labour. With POJ 2878, however, the industry had come up with something that was almost immediately transferable to rival producers. In terms of the key East Asian market for the Java industry's output, by the late 1920s the island's producers were facing increasingly stiff competition from the Japanese-run sugar industry in their colony of Formosa. It was ominous, therefore, that by the end of the decade

[36] Demandt 1929:28-9.

[37] During the first two decades of the twentieth century, *bibit* was sourced at various times from as far away as Bandung in West Java, Salatiga in the mountains of Central Java and, rather nearer to home, from a grower in Blitar, in the upper reaches of East Java's Brantas river; see Jaarverslag Modjo-Agoeng 1906; 1911, pp. 5-6; 1913, p. 7, in: NA, NHM, 2.20.01, inv. nr. 9383. In 1913, for example, the cost of cane-cuttings amounted to around 20% of plantation costs and nearly 10% of total production costs (Jaarverslag Modjo-Agoeng, 1913, p. 16, in: NA, NHM, 2.20.01, inv. nr. 9383). *Bibit* costs per *picul* of sugar amounted to 0.48 guilders, total *aanplant* costs to 2.61 guilders and total production cost to 4.69 guilders.

the Formosa factories had already taken up *wondercane* in a big way.[38] Nonetheless, the fact remains that, on the eve of the crisis in the international sugar economy that almost destroyed it in the early 1930s, the Java industry as a producer of sugar had never been in a better state. It was manufacturing more, better and cheaper sugar than at any time in its history. The only trouble was that it could no longer sell it.

38 Arthur H. Rosenfeld's report on the Taiwan sugar industry (Rosenfeld was 'Advisor to the American Sugar Cane League'), originally in *The International Sugar Journal* (31 September 1929), appeared in translation as 'Een en ander omtrent de suiker-industrie in Formosa' (Rosenfeld 1929). At the same time POJ 2878 was also being taken up in the Philippines (Perk 1931:245-6), though with consequences a good deal less dire, since virtually all centrifugal sugar from the Philippines went to the USA, whose sugar market had been effectively closed to the Java producers for two decades or more.

Chapter 8

Commercial nemesis

Java, Japan and the Raj

H.C.Prinsen Geerligs was the doyen of the Java sugar industry's scientific advisors. Born in the Netherlands, he had spent most of his adult life in the Indies, much of it – as will be apparent from earlier chapters of this book – in the employ of the sugar syndicate at one or other of their research institutes.[1] The industry thought so well of his services as a researcher and publicist that it had given him the considerable sum of 50,000 guilders to mark the occasion of his jubilee in 1916.[2]

In April 1932, by then in comfortable semi-retirement in Amsterdam's well-heeled 'Old South', he received a letter from India. The writer wanted Prinsen Geerligs' advice. He 'had been informed that some good 2nd hand cane crushing and sugar manufacturing plants are now for sale in your Java', and he was hoping that his correspondent would oblige him with specifications and price. The old man evidently wrote back, promising to send the addresses of companies in Java that specialized in dismantling sugar factories – and passed the letter on to the head office of the mighty NHM in Amsterdam with a request that they would forward the necessary details.[3]

By early 1932, there was indeed a plethora of sugar-manufacturing equipment for sale in Java, and during the following two years there would be a great deal more. Between 1931 and 1936, the industry permanently lost around 50 per cent of its productive capacity in the

1 Hendrik Coenraad Prinsen Geerligs, born (Haarlem) 24 November 1864, died (Amsterdam?) 31 July 1953. The son of a school principal, he graduated in 1883 from the Handelsschool in Amsterdam, and for the next six years studied chemistry at the University of Amsterdam. Following a period working in the 'technisch-chemisch' office of the Amsterdam firm of Wynhoff & Gulpen, he went to Java in 1891 as an assistant chemist at the Kagok Sugar Research Station (subsequently merged into the celebrated Pasuruan Research Station). He was the author of innumerable books and articles on the Java sugar industry and world sugar production. For details of his career, see *Jubileum Prinsen Geerligs* 1916.

2 Notulen bestuursvergaderingen, 4-8-1916/460, in: NA, HVA, 2.20.32, inv. nr. 2.

3 The correspondence is in NA, NHM, 2.20.01, inv. nr. 5131.

A doyen in retirement: H.C. Prinsen Geerligs and his wife, Mevrouw Prinsen Geerligs, on the occasion of their fortieth wedding anniversary, Amsterdam, 1931 (Stadsarchief Amsterdam, 010003032768) http://beeldbank.amsterdam.nl/beeldbank/indeling/detail?q_searchfield=1931%20huwelijk

wake of the dramatic decline of the Asian sales for Java sugar that had sustained it for almost two decades. Nor was it a mere coincidence that Prinsen Geerligs' correspondent hailed from Bhagalpur, in the northern Indian state of Bihar. The Indian subcontinent had, up till then, been the largest single market for Java sugar – and the prime reason for the loss of that market was the rapid development there of the industrialized manufacture of sugar. In 1930 Java had exported more than a million MT of sugar to Indian ports, primarily Calcutta and Bombay. Six years later India was taking scarcely a tenth of that amount. The collapse of the Indian market for Java's output, however, was only one aspect of the globalization of the international sugar economy that had brought Indonesia's Big Sugar to its knees.

GLOBALIZATION, THE INTERWAR DEPRESSION AND ECONOMIC AUTARCHY

Predicated on their ability to supply cheap, factory-made sugar, from the late nineteenth century onward the Java producers had been able to exploit a growing taste elsewhere in Asia for forms of the commodity that were white, hygienic and 'Western'. Some of this sugar was refined after it had been dispatched from Java, but a substantial proportion of it arrived in the shape of factory white that was available for immediate consumption. On these twin pillars, by the 1920s the Java industry had grown moderately prosperous – and greatly expanded its operations – by supplying outlets in China, Japan and the Indian subcontinent with almost all the sugar that it produced. It had been able to compensate thereby for its almost complete loss of regular sales in Europe or North America. Its status as the prime purveyor of factory-made sugar to Asian markets had been reinforced, moreover, by the elimination of competition from the beet sugar producers in Imperial Germany and Austria-Hungary after the outbreak of war in Europe in August 1914.

It was virtually inevitable, of course, that Java's enviable position would not last forever. Nonetheless, the island's colonial producers gambled on an almost limitless expansion of the Asian market, and on their own superior expertise and efficiency to ensure their hold over it. This proved to be a miscalculation. During the interwar decades, the industry's late colonial trajectory began to unravel, eventually in fairly

dramatic fashion. Java's output peaked in 1930 at a little over 3 million MT. Five years later, only thirty of its nearly 180 factories remained in operation, and their production amounted to scarcely half a million MT. Sales had plummeted, so that Java ran some danger of submerging under a mountain – as much as 3 million MT – of unsold sugar, part of which, at least, had to be disposed of at fire-sale prices.[4] The depth of the crisis experienced by the Java industry during the interwar depression singled it out from virtually all its major competitors in the international sugar economy. Even Cuba, hard-hit as it was, bottomed out at a far higher production point than did Java; it also recovered much faster, not least because of its connection to the United States' market.[5]

A fall-off in sugar consumption worldwide consequent on the interwar depression was not the heart of the matter, however. To be sure, recorded world sales of sugar fell after 1930, following a decade of considerable growth, and they remained in the doldrums for the better part of the subsequent decade.[6] Nonetheless, the exact situation with respect to Java sugar's (erstwhile) major customers is far from clear. In Japan (where the relevant data might be assumed to be fairly reliable), the secular trend toward rising per capita consumption of sugar faltered briefly early in the 1930s and then resumed its upward trajectory. [7] In China, which, together with the Indian subcontinent, had constituted by far the biggest market for Java sugar, largely impressionistic evidence is that per capita consumption indeed fell. A Dutch commercial report of 1933, for example, sought to explain the disastrous decline in the sales of Java sugar in China in terms (in part, at least) of the 'constantly declining purchasing power of the population'.[8] It is equally clear, however, that

4 H.C. Prinsen Geerligs and R,J. Prinsen Geerligs 1938:81-2. For a general overview of the history of Java sugar prices, 1880-1940, see Appendix 1.

5 Cuba's output peaked at an exceptional 5 million MT in 1929, and hit a low of under 2 million MT some four years later in 1933. After that, however, its production rapidly returned to over 50% or more of its pre-Depression peak. Not least, this was because it was able to maintain – from 1934 onward – a level of exports to its main United States' market that, in most years, amounted to nearly two-thirds of its average sales during the previous decade (Pollitt 1984:4-7).

6 World consumption, calculated at 13.3 million MT in 1920/21, had risen to a peak of 24.4 million a decade later, and declined to a low of 22.1 million in 1932/2 (H.C. Prinsen Geerligs and R,J. Prinsen Geerligs 1938:50-1).

7 H.C. Prinsen Geerligs and R,J. Prinsen Geerligs 1938:70. The secular trend over less than two decades was for an increase in consumption of more than 100%, from 485,427 MT in 1919 to 1,114,000 MT in 1937.

8 Jaarverslag NHM Agentschap Shanghai, 1933, p. 49; 1934, p. 38, in: NA, NHM, 2.20.01, inv. nrs. 5171, 5172.

depression conditions affected the various strata of consumers differently; that industrially manufactured sugar generally found its markets among middle classes who experienced the depression less harshly than workers and peasants; and that we need to be wary of an unquestioning application of the 'depression' concept to developments during the course of the 1930s. Ramon Myers, for example, has argued that the Chinese economy experienced growth rather than regression for much of the decade.[9]

In short, although Java sugar's problems as an export-based industry ostensibly started with the interwar depression of the 1930s, in reality their origins were altogether more complex and deep-rooted. They were to be found, most specifically, in the industry's failure to become fully incorporated during the previous decade into Japan's burgeoning sugar empire, and in developments in the Indian subcontinent that predated the Depression but were greatly accelerated by it. More generally, however, the fate of Java sugar had to do with the globalization of the world economy. More specifically, it related to that industrial take-off beyond the confines of the West which was one of globalization's key aspects. Global industrialization has sometimes, not entirely correctly, been seen as an essentially late twentieth-century phenomenon. In fact, it had important precursors much earlier. In turn, this 'precocious' phase of globalization impacted very significantly on the international sugar economy, nowhere more so than in Asia – and very much to Java's detriment. By spreading the industrial manufacture of sugar to key areas of South and East Asia, globalization first undermined Java's hegemony there, and ended by creating a situation in which the island's producers were almost totally deprived of what had become their main markets.

JAVA AND THE JAPANESE SUGAR EMPIRE

Java's relations with the emergent Japanese sugar empire had been a critical element in sustaining its position in the age of mass production. As we saw in an earlier chapter, the Java industry had long-standing and ongoing connections to the great British-owned refineries in Hong Kong, which dated back to the 1880s. However, when the latter experienced

9 Myers 1989.

increasing difficulties after the Great War, the Dutch colony's producers became increasingly dependent on the Japanese refineries – and on Japanese sugar traders – with which they had first opened relations at the very beginning of the twentieth century. In effect, by the early 1920s (though it also maintained a huge stake in the Indian sugar market), Java had become a crucial part of a Japanese-controlled network of producers of raw sugar, sugar shippers and traders, refineries and consumers that extended throughout East Asia and the Pacific. Although Japanese interests owned only a miniscule part of Java's productive capacity, in tandem with several big Indies-Chinese commercial combines they had come to play a key role in the Dutch colony's sugar trade with East Asia, as financiers, buyers and shippers. Then, quite suddenly, and – as contemporaries saw it – quite unexpectedly, toward the end of the 1920s the situation changed dramatically. The most ambitious of the Japanese sugar traders went under, in a development that threatened to take with it the entire Japan-Java nexus in sugar.

In 1927, the Suzuki zaibatsu, one of the largest (though not the oldest) of Japan's commercial, financial and industrial conglomerates, suddenly collapsed, undermining a sizeable swathe of key Japanese financial institutions, both in Japan itself (where the prime minister and cabinet also fell victim to the crisis), and in Formosa. With close financial ties to the failed zaibatsu, the Bank of Taiwan (BOT) had to close its doors temporarily, and to curtail its subsequent operations.[10] Suzuki had been very big in Java's trade in sugar to Japan over the previous decade, and in some years had been the largest single Japanese buyer. Its collapse, in tandem with the economic consequences of the contemporaneous Tokyo earthquake, precipitated a crisis in Japan's sugar empire that signalled the unravelling of Java's key role. The crisis also took its toll on those Indies-Chinese multinationals that were heavily dependent on Japanese or (in so far as it could be distinguished) Japanese-Formosan capital. In particular, it may be presumed to have curbed the activities of Kian Gwan, the commercial arm of the great Indies-Chinese OTHC conglomerate,[11] and probably contributed to the gradual collapse, from

[10] Lynn and Rao 1995:62-3; Schneider 1998:173.

[11] Between 1925 and 1930, with a significant dip in 1928, Kian Gwan traded around 250,000 to 300,000 MT of sugar annually, before falling back to only 12,600 MT in 1932 – by which date, however, Java sugar found very few purchasers anywhere (Jaarverslag VJSP 1930, p. 14; 1932, p. 12, in: NA, VJSP, 1918-1938, toegangsnummer 2.20.09.02, inv. nrs. 16, 18).

the end of the 1920s, of KHT, the most commercially aggressive of the Indies firms trading with East Asia. [12] All this was bad news for the Java sugar industry. Moreover, there was worse to come. Driving the evolving situation – one that saw Java sugar fairly rapidly marginalized in the Japanese market – were two underlying factors that spelled very serious, long-term trouble. One was the impact on the market for sugar in East Asia of the growing political turbulence in China; the second was the emergence of Formosa as the new heart of the Japanese sugar empire.

THE CHINA MARKET: BOYCOTTS, 'SMOKELESS SUGAR' AND FACTORY WHITE

The military-political situation in China in the late 1920s was one in which escalating civil war intermittently brought large-scale trade to a virtual standstill in the Yangtze Valley hinterland of Shanghai, the key centre for the sugar trade that provisioned central China. In 1929, for example, Dutch commercial reports from the city spoke of 'turmoil in the interior' that had led to the stockpiling of nearly a million sacks of sugar in the city – twice the usual amount – and in the following year the same source reported many bankruptcies, including that of 'one of the biggest and most solid [*betrouwbaar geachte*] of the city's Chinese importers'.[13]

From the late 1920s onward, moreover, well before they embarked on a full-scale war in China, Japanese military aggression (notably the Jinan Incident of May 1928) and answering Chinese boycotts of Japanese goods and business created considerable problems for the Japanese sugar trade on the China coast.[14] In Shanghai itself, the Japanese-owned refinery was forced to close.[15] It was in the Shanghai market, in particular,

[12] On the collapse, see Claver 2006:342-4; Post 2002. For specific evidence of KHT's declining position in the Java sugar trade at the end of the twenties, see Butterfield & Swire Hong Kong to Swire London, 15-2-1929, Sugar Refinery Letters 1929, JSSV 1/2: 'we will keep in mind what you write about the possibility of selling arrangements with some Chinese, but our latest information is that Kwik Ho Tong is no longer as reliable as he was, Kwik himself is growing old, and there is said to be nobody of capacity to carry on the business after him […] Kwik, it appears, has withdrawn himself and his cash to Hong Kong. Without him there is no strength in the "show". I gathered that W[oodforde] would not now sell to us KHT sugars with anything like the confidence he had when the old gentleman was at the helm.'

[13] Jaarverslag NHM Shanghai, 1927, p. 34; 1929, p. 9; 1930, p. 23, in: NA, NHM, 2.20.01, inv. nr. 5171.

[14] Goto-Shibata 1995:67.

[15] Jaarverslag NHM Shanghai, 1927, p. 36; 1928, p. 27, in: NA, NHM, 2.20.01, inv. nr. 5171.

that the anti-Japanese boycott had its greatest impact: so much so indeed that, by the middle of 1929, Japanese sugar dealers were resorting to repacking their sugar into the gunny sacks typical of Netherlands Indies' production and attempting to sell it as 'crushed Java'.[16] Roughly contemporaneously, moreover, the British refineries in Hong Kong – Taikoo and the CSR – also experienced difficulties. Beginning in 1925, boycotts, strikes and political turmoil in their southern China hinterland made for a disastrous period for business. Taikoo survived after a temporary shutdown, but the CSR closed down for good.

'A FLOOD OF FACTORY WHITE': JAVA AND THE CHINA MARKET AT THE END OF THE 1920S

In the short term, these developments were not necessarily detrimental to the Java industry. Indeed, they appear to have created an opportunity for large quantities of factory white from Java – unrefined, but ready for direct consumption – to plug the gap that was left by the disruption to the supply of refined sugar. Early in 1929, the Taikoo refinery's British owners had prefaced an analysis of future prospects with the observation that China had become 'with its deep and practically open market […] the world's dumping ground for sugar: the Japanese are dumping unmercifully; Java [that is, Java factory white] is flooding the market at rock bottom prices; Cuba is also turning its attention in this direction; [and] the Continental beet producers are also looking this way'.[17]

Even so, 'China', as the Taikoo's owners observed, was not one market but three: northern China and Manchuria constituted one sector; a second was formed by central China and Shanghai; and a third was that of southern China (and adjacent Hong Kong). At the end of the 1920s, the first of these sectors, boycotts notwithstanding, was the one 'in which the pace is set by Japanese sugars'.[18] In the second and third sectors, however, the circumstances just described combined toward the close of the decade to provide an unprecedented opening for Java's factory white, which more or less dominated the market in south China and vied for

[16] BSHK to Swires, 12-7-1929, JSSV 1/2.
[17] BSHK to Swires, 5-7-1929, JSSV 1/2.
[18] Swires to BSHK, 18-1-1929, JSSV 1/2.

supremacy in central China and Shanghai with Japanese imports. Until 1927, the bulk of the Java industry's exports to East Asia took the form of raw sugar. Despite the very significant fall in refinery purchases – and especially in sales to Japanese refineries in the late 1920s – Java's exports to East Asia, in the 'new' form of factory white, remained buoyant. In 1925-1926, total exports to all such destinations (Hong Kong, China and Japan) amounted to 880,877 MT, while five years later (1930-1931) they stood at 885,023 MT, despite a drop of nearly 50 per cent in the amounts going to Japan and its refineries.

Nonetheless, developments in the China market need to be placed in perspective. Although Java maintained the 1925-1926 level of exports to East Asia, it proved incapable of increasing its overall sales in the region during a period in which its output of sugar grew significantly. Production, which had stood at around 2.3 million MT in 1925, had risen to a little over 3 million MT by 1930. Much of this 'excess' production was absorbed by the South Asian market; developments there, however, were about to make Java's prospects in the subcontinent even less promising than those in China, where, by 1932, the boom in the import of factory white was coming to an end.

Most immediately, the Java industry's prospects in East Asia were stymied by the imposition by the Chinese Nationalist authorities of a substantial tariff on imported sugar. This took place in the context of attempts not only to raise revenue but also to protect the development of a nascent industrial base for indigenous sugar manufacture, a development in which the state was itself directly involved. The actual production of industrially manufactured sugar in China during the 1930s was so small as to have had little direct impact on existing overseas suppliers, though a parallel upsurge in peasant-made brown sugar may indeed have had some effect. Notionally, at least, high duties on imported sugar meant that it was priced out of the range of many consumers, turning it into what Dutch sources lamented had become a 'luxury item'.[19] Even more to the point, however, the new tariff regime promoted large-scale smug-

[19] Jaarverslag NIVAS, 1933-1934, p. 52, in: NA, NIVAS, 1932-1958, 2.20.09.03, inv. nr. 8. At the end of 1930, the Nationalist government in Nanjing used its newly regained tariff autonomy to impose a duty of 35% on imported sugar. The real blow to importers, however, came in May 1932, when the duty was raised to around 80% (Kubo 2005:147-8). The actual figure may have been considerably higher. In the mid-1930s, for example, Dutch commercial agents in Shanghai claimed that the tariff equated, in the case of Java's factory white (the most expensive quality of Java sugar), to 200% or more of its value (Jaarverslag NHM Shanghai, 1934, p. 46; 1935, p. 48, in: NA, NHM, 2.20.01, inv. nr. 5172).

gling, the chief beneficiaries of which were rival Japanese sugar interests, who – by now – drew increasing amounts of their raw material from sources other than the Netherlands Indies. In combination, these two developments had serious consequences for the Java industry's hopes of retaining its hold over the East Asian market.

DOMESTIC SUGAR PRODUCTION IN NATIONALIST CHINA

The production of industrially manufactured sugar began in south China in the mid-1930s, under the patronage of the Nationalist leader Chen Jitang, whose regime monopolized the production and sale of white sugar throughout Guangdong.[20] Half a dozen modern sugar factories, with equipment originating from either Czechoslovakia (Škoda) or the United States (Honolulu Ironworks), were established there, variously under military and civilian auspices, and presided over by Dr Feng Rui, an American-trained agricultural expert and chief architect of Chen's sugar production scheme.[21] Some of the technicians, including a number of Indonesian-Chinese sugar makers, were ex-employees of the Java industry.[22] In 1937 (after the ousting of Chen Jitang and the execution of Feng Rui on a charge of large-scale sugar smuggling), colonial Indonesia's Kian Gwan, a multinational *avant la lettre* (with what was said to be an 'outstanding' business organization in China and ready access on a personal level to influential people in the Nanjing government) took over the running of several of the factories.[23] In a development likewise

[20] Hill 1998; Lin 2002:200-2.

[21] Hill 2010. For contemporary Dutch accounts of developments that touched on their prospects in a major market for Java sugar, see Jaarverslag NHM Hong Kong, 1934, pp. 4, 14-6, 20-1; 1937, p. 10, in: NA, NHM, 2.20.01, inv. nr. 5172; 'A brief report on the sugar industry of China', no year, appendix, J.J. Wierink to NIVAS, 22-3-1937, in: NA, NIVAS, 2.20.09.03, inv. nr. 383.

[22] Wierink to NIVAS, 29-2-1936, in: NA, NIVAS, 2.20.09.03, inv. nr. 383.

[23] Kian Gwan, under the name of Hsing Wah, was appointed (1937) to the general management of the two 'military' mills in Canton. The firm was to get 20% and the military 80% of the profits (BSHK to Swires, 16-4-1937, JSSV 1/9; see also Wierink to NIVAS, 7-10-1936, in: NA, NIVAS, 2.20.09.03, inv. nr. 383). One minister in the Nanjing government was said be a friend and former fellow student of Oei Kan Tjwan, Kian Gwan's chief representative in China, and the Oei Tiong Ham family (owners of Kian Gwan) had family ties with the former Foreign Minister of the regime ('Extract brief Waarnemend Inspecteur der NHM NV Shanghai to NHM Batavia, 26-4-1933, in: NA, NIVAS, 2.20.09.03, inv. nr. 537). According to information collected from members of the family, OTHC/Kian Gwan had close links in Shanghai with Chen Kung Po, one-time mayor of the city who subsequently became 'a minister in the Japanese puppet regime of Wang Ching Wei', in partnership with whom they ran a large alcohol distillery near the city (1934) (Post 2011:176-7).

foreshadowing overseas Chinese investment later in the century, Straits Chinese capital was also tentatively involved. However, neither development came to fruition. The Straits interests withdrew,[24] and Kian Gwan severed its links within less than a year.[25]

It cannot be said with any degree of certainty how much industrially manufactured sugar was actually produced in southern China around this time. From the vantage point of their Hong Kong enclave, the British managers of Taikoo viewed the whole development with some scepticism. They did not doubt south China's potential for producing large amounts of industrially manufactured sugar. However, 'turning to actualities, corruption, mismanagement, lack of care and official interference have so far prevented any large-scale production, and with recent successive changes of officials, the industry is very near to a standstill'.[26]

FORMOSA: JAVA'S NEMESIS

Java sugar's problems in the East Asian market by the 1930s were multiple.[27] Fundamentally, however, what sunk Java sugar's hopes of continued sales in China and Japan was the emergence of Formosa as a major producer of industrially manufactured sugar. Developments on the island from circa 1910 onward (the Japanese had forced its transfer from China some fifteen years earlier) reflected the determination of Japan's leading zaibatsu to create a Japanese sugar empire that would supply not only the rapidly expanding requirements of the modernizing Japanese metropolis, but also the East Asian mainland which was coming increasingly under Japanese sway from the mid-1920s onward. As we have seen, Java had initially been a key supplier of raw material to the Japanese refineries, but in the late 1920s Formosa had started to replace it.

The sugar industry that the Japanese took over after gaining control of Formosa was an antiquated one. Subsequently, however, and with strong government backing, Japanese companies began pouring in

[24] In 1937 a Straits Chinese consortium (PAN) was reported to be involved in negotiations to run the 'civilian' factories (that is, those not currently run by Kian Gwan) (Wierink to NIVAS, 8-4-1937, in: NA, NIVAS, 2.20.09.03, inv. nr. 383.

[25] By the middle of 1938, Kian Gwan's connection had ceased and its staff had been withdrawn (Wierink to NIVAS, 12-8-1938; 1-9-1938, in: NA, NIVAS, 2.20.09.03, inv. nr. 383).

[26] BSHK to Swires, 2-7-1937, JSSV 1/9.

[27] Knight 2010.

capital, and importing know-how, to create a network of state-of-the-art sugar factories that emulated those of Java. Formosa now produced both raw sugar for Japanese refineries and factory white for direct consumption throughout East Asia.[28] By 1930, there were forty-eight fully industrialized sugar factories operating in Formosa, producing some 571,718 MT of sugar from more than 117,000 hectares of cane. This output was, of course, very much less than Java's nearly 3 million MT. Quite exceptionally among the world's major sugar industries, however, production in Formosa continued to grow during the decade of the Depression. By 1940 output amounted to more than one million MT, not much less than that of the revived but much-shrunk industry on Java, and Formosa had become the world's fourth-largest producer-exporter of cane sugar, much of it factory white well suited to supply the Chinese market without any need for further refining.[29]

The impact on the Java industry was far-reaching. In the early 1920s, when Formosa first began to make significant inroads in the metropolitan Japanese market, Java still supplied about 50 per cent of Japan's requirements. By the end of the decade, however, Formosa (and other Japanese colonial sources) was supplying around 75 per cent and Java only 25 per cent – and worse was yet to come: indeed, at the very close of the 1930s, Java accounted for a mere 15 per cent or less of Japan's imports, and Formosan sugar totally dominated the market.

Java sugar and the trade war between the Netherlands Indies and Japan

Nonetheless, although the rise of industrial sugar production in Formosa eventually served to marginalize Java in the Japanese sugar empire, at the beginning of the 1930s the demise of the Dutch colonial industry's East Asian markets was far from a foregone conclusion. For all that Formosa took over from Java as the main supplier to Japanese refineries during the course of the 1920s, the colony was not in a position totally to supplant Java in the Japanese sugar empire. Such calculations as are currently

[28] For the Formosa industry, see Mazumdar 1998:368-82; Ka 1995:62-9, 109-25.

[29] Data from Rosenfeld 1929; *Formosa suikerproductie* 1933 (which shows Formosa's output in 1931-1933 to be composed overwhelming of factory white); Ho 1978:357. Formosa had started to produce factory white a few years before the First World War (H. Schmidt 1912).

available suggest that although Formosa's output was sufficient to supply Japan's domestic market, its factories could not meet the demands of Japan's expanding sugar empire on the East Asian mainland.[30] Moreover, there seems no doubt that Java's sugar was cheaper to produce than that of its Formosan counterpart – and was hence notionally more attractive to Japan's refineries than the output of their own colonial possessions.[31]

Attempts to reintegrate Java into the Japanese sugar empire after the debacle of 1927, however, ran up against a number of obstacles. Chief among them were the conflicted commercial relations between the Netherlands Indies and Japan that developed during the course of the 1930s. It may indeed be the case that embedded in this history (as Sugiyama and Grove have noted in a broader context) are themes of collaboration as well as of rivalry.[32] Nevertheless, it was a trade war between the Netherlands and Japan that effectively sank any hopes that the Java sugar producers might find salvation in renewed ties to the Japanese refiners and to the Japanese sugar empire in general.

It was a complex situation.[33] On the one hand, Japanese cotton goods manufacturers were anxious to sustain and expand their market in the

30 Writing circa 1937, H.C. Prinsen Geerligs and R.J. Prinsen Geerligs (1938:67, 69-71) remarked that the 'production of Japan and Formosa is about equal to Japan's consumption. Yet the country imports great quantities of raw material for the refineries, which ship the equivalent to the Asiatic mainland viz China, Manchuko, Korea etc.' A similar point emerges from a NIVAS reportage from this era. For instance, in 1936 the organization noted that an increase in exports of raw Java sugar to Japan was predicated on the growth of Japanese refinery sales in China. They also drew attention to rising per capita consumption in Japan itself as a promising sign for the Java industry (Jaarverslag NIVAS, 1935-1936, p. 22, in: NA, NIVAS, 2.20.09.03, inv. nr. 10. Even on Japan's home market, although imports from Formosa were said to contribute to 75% of domestic consumption (Ho 1978:31), they nonetheless fell well short of the total amount.

31 Ho (1978:73-4) notes that this stemmed from climate problems and relatively backward cultivation techniques (consequent on the sugar company's decision to rely primarily on 'cheap' and risk-free peasant smallholder production). Ka (1995:123-4) argues that 'Formosa was not an efficient producer of sugar, the growth of the industry was confined to the Japanese market, where it received preferential treatment'. As a result, 'Japan could have obtained sugar more cheaply from Java than from Formosa'.

32 Grove and Sugiyama 2001:11.

33 For a succinct discussion, see Taselaar 1998:410-2. For elaboration and documentation, see Dick 1989:251-5, 2002:158-62; Booth 1994, 2002:79-85; Post 1995. On trade negotiations in general, see Dick 1989:254-8. On the possibility of a deal over sugar, see NHM Kobe to Amsterdam 3-5-1934; 5-5-1934; 8-5-1934, in: NA, NHM, 2.20.01, inv. nr. 9230. For a general overview of these negotiations, see the files relating to the Netherlands Indies' trade negotiations, 1934-1936 in: NA, Collectie 190 J.W. Meyer Ranneft, 1910-1968, toegangsnummer 2.21.121, inv. nrs. 93, 98. The specific information quoted here comes from inv. nr. 98, Bijlage 16. I am grateful to Jeroen Bouterse, of Leiden University, for kindly investigating this source on my behalf. For information on Japanese sugar interests in Formosa (and references to Japanese sources), see Schneider 1998:163-4. For a contemporary Western account (circa 1930) of the refinery interests of Mitsui, Mitsubishi (and Dai Nihon), see *Suikerindustrie Formosa* 1931. This lists the Mitsui, Mitsubishi and Dai Nihon refineries in metropolitan Japan and their links with Formosa (but

Indies. In pursuit of this, they appear to have been prepared, had they been able to, to sacrifice the interests of the Japanese-Formosa sugar producers as part of a deal that would have allowed Java sugar into Japan in return for reduced tariffs on Japanese cotton goods imported into the Indies. Understandably, any such proposal met with fierce resistance from Japan's 'sugar barons', represented by the country's leading zaibatsu (just to complicate matters further, the latter also had a stake in the cotton goods industry).

On the Dutch side, meanwhile, there were likewise tensions between the interests of metropolitan cotton-goods manufacturers, who wanted to keep cheap Japanese cotton goods out of the Indies, and the metropolitan-colonial sugar interest that was prepared to accept this as the necessary trade-off for the entry of substantial amounts of Java sugar into the Japanese arena. The situation was further confused, moreover, by the determination of the Indies government to promote cotton goods manufacture in the colony itself, as part of a larger programme of industrialization in the archipelago. The eventual outcome, over a period of years, went against Java sugar. Japanese cotton goods were (largely) kept out of the Indies and Java sugar lost a (possible) opportunity of finding a secure market in Japan. On the Dutch side, Java sugar was thereby sacrificed to a mixture of competing metropolitan interests. In short, by the late 1930s Big Sugar lacked the heft to prevent the state cutting the industry loose when the demands of a larger colonial-metropolitan economic strategy appeared to require it.[34]

It was not a total defeat. When a separate sugar agreement was finally reached between Netherlands Indies' and Japanese sugar interests, at the end of 1936, it contained provisions for minimizing competition in the China market, in return for which the Japanese refineries undertook to increase, as far as possible, their imports of raw Java sugar into

has virtually no information on Ensuiko, likewise one of the top firms involved, with links to Mitsubishi). The article shows that circa 1930 some 30% of all Formosa sugar came from what was, in effect, Mitsui's Formosa Sugar Co (Formosa Seito Kabushiki Kaisha). Mitsui was by far the largest single shareholder in the firm, followed by the Japanese royal family. The company had two metropolitan refineries, one in Kobe and the other on Kyushu at Kurume. Mitsui was followed (in almost equal importance) by the Mitsubishi-linked Meiji Sugar Co, with three refineries in Japan and one in Shanghai (Meika), opened in 1924. The Dai Nihon Sugar Manufacturing Co, circa 1930, appears to have had the largest refining capacity – with three in Japan and one in Korea. For a brief reference to Mitsubishi's long-standing interest in Ensuiko, already in place in the 1920s, see, for example, BSHK to Swires, 25-10-1929, JSSV 1/2.

34 For an overview of the long-term economic nexus between the Indies and its metropolis, see Lindblad 1996.

Japan.[35] It appears, however, to have left the Japanese sugar refiners free to develop their interests in sugar production in Formosa. In these circumstances, a great deal hinged on the potential for expansion in the China market, beset from 1937 onward by the outbreak of full-scale war between the Nationalist government and Japanese invaders. The upshot was perhaps predictable. Though in 1936-1937 Japanese imports of raw Java sugar amounted to over 250,000 MT, a figure not reached since 1930-31,[36] by the end of the decade Java's sales to Japan had been reduced to a mere trickle. In respect to Java sugar's other great Asian market, moreover, the outlook was hardly less gloomy.

IN THE SHADOW OF THE RAJ: JAVA SUGAR AND INDIAN PRODUCERS IN THE INTERWAR DECADES

The largest single market for the Java industry for much of the 1920s was not in East Asia, but in the Indian subcontinent. Java sugar, much of it ready for direct consumption without the need for further refining, had made big inroads there since the turn of the century. Factory white, as we have seen, was manufactured on a very large scale in Java, where by the 1920s around half of the island's colonial manufacturers turned out a product that came straight off the production line in a form that exhibited an acceptable degree of whiteness and granulation. In consequence, and in contrast to the situation in East Asia, the market for Java sugar in the subcontinent was not serviced by refineries, but by importers of a directly consumable form of the commodity.

The bulk of this export business, predominantly in factory white, was handled by Java-based firms, though Mitsui Bussan Kaisha (Mitsui Trading Company), part of the eponymous Japanese zaibatsu, was also engaged in the trade. Indeed, they already had an office in Bombay as early as 1910.[37] To be sure, a number of Indian firms also participated.

35 *Sugar agreement* 1937.

36 H.C. Prinsen Geerligs and R.J. Prinsen Geerligs 1938:83-4.

37 See *Suikermarkt Bombay* 1911, where the writer remarks that nine-tenths of the Java sugar imported into Bombay circa 1911 is in the hands of five firms: Bombay Sugar Co, Ralli Bros, David Sassoon & Co, Mitsui Bushen Kaischa, and Patna and Sons. For confirmation of Ralli Bros' continuing role in the late 1920s, see B.M. Talati to BSHK, 23-5-1929 in Sugar Refinery Letters 1929 JSSV 1/2. The writer remarked that the bulk of India's supply came from Java, and that the business was 'mostly in the hands of wealthy merchants of Bombay province, and almost all of them have branches or at least agencies in Java. Messers Ralli Bros stand prominent among the foreign firms importing Java sugar'.

David Sassoon & Co,[38] Patna and Sons, M.V. Patel and Abdul Rahim Oosman & Co were among those operating in the 1910s and 1920s.[39] The quantities of sugar which they handled, however, tended to be relatively small in relation to Java's total export to the subcontinent. In 1927, for example, when total shipping of the commodity to Indian ports amounted to over 800,000 MT, Indian buyers accounted for less than 6 per cent of it (47,650 MT).[40] Rather than Indian firms, the main participants would appear (apart from Mitsui) to have been the 'usual suspects' among the big trading concerns operating outside of Java. Kian Gwan was among them – though by the 1930s it was said that their agent in Calcutta had not so much gone 'native' as gone *British* in his ways, much to the detriment of his contacts in the bazaar, and that Kian Gwan's provisioning of the market there was erratic.[41] The others were (presumably) Wellenstein Krause & Co, Erdmann & Sielcken and (most certainly) the Maclaine Watson 'group', in particular Fraser Eaton & Co in Surabaya.

In the subcontinent itself, Maclaine Watson (in its various permutations) worked closely with the India-based Ralli brothers, with whom (in both London and Java) the firm and its metropolitan associates were said to have enjoyed a quite exceptionally close and confidential business relationship.[42] Established in the mid-nineteenth century as the Indian offshoot of a company founded in London by members of the Greek diaspora in the 1820s, Ralli was a key player in the Indian sugar market until well into the 1930s (by which time exports from Java had dropped off dramatically).[43] Indeed, from around 1930 until 1937 – when it appears to have broken up – Maclaine Watson and Ralli formed a partner-

38 For Sassoon ('the Rothschilds of the East'), see Betta 2005.

39 For the 1920s, see, for example, Jaarverslag VJSP 1930, pp. 13-6, in: NA, VJSP, 2.20.09.02, inv. nr. 16, for a complete list of buyers of the 90% or so of Java sugar that VJSP handled.

40 Jaarverslag VJSP 1930, p. 16, in: NA, VJSP, 2.20.09.02, inv. nr. 16.

41 G.M. Schuitemaker to NIVAS, 8-2-1934, in: NA, NIVAS, 2.20.09.03, inv. nr. 382.

42 '[…] er tusschen Ralli en hunne relaties op Java [that is Maclaines/MacNeill/Fraser Eaton] een veel betere en meer vertrouwelijke samenwerking bestaat, dan, Kian Gwan uitgezonderd, bij eenige andere relatie mogelijk is'. See G.M. Schuitemaker, 'Reisverslag Britsch-Indië, 16-1-1934 tot 12-4-1934', 25-5-1934 [hereafter Schuitemaker, 'Reisverslag'], p. 66, in: NA, NIVAS, 2.20.09.03, inv. nr. 382.

43 Founded in London in 1818 by Greeks from Chios, the firm opened a branch in Calcutta in 1851 (at a time when their capital was in excess of 500,000 pounds sterling 'which compared favourably with the top British mercantile houses of the period'). For a general history of Ralli Brothers, see Chapman 1998:163-4 and the references therein.

ship known as the Maclaine Sugar Company.[44] During the 1930s, the Indian operations of the Swiss-based firm of Volkart[45] were said to be giving Ralli Brothers a run for their money – but in respect to the sugar trade specifically, the latter appear to have retained their predominance, until the trade itself dried up toward the close of the decade.[46]

At the peak of the trade at the end of the 1920s, the Indian subcontinent took around 45 per cent of Java's total exports of sugar, amounting to well over one million MT (up from around half a million early in the decade). Thereafter, however, the market contracted sharply, compounding the problems that the Java industry was experiencing in East Asia. By 1931-1932, Java's exports to South Asia had fallen by about 50 per cent from their peak two years earlier, and during the remainder of the decade (there were violent fluctuations in the trade, consequent on the state of the cane harvest in northern India) averaged at a little over 250,000 MT annually – less than a quarter of the amount exported in the boom years.[47] Setbacks in this market related to a different set of circumstances, however, than those prevailing in East Asia. In part, they stemmed from the competition from other overseas suppliers that Java sugar had always had to fend off on the Indian market. The problem was less the sheer volume of such rival imports than the fact they acted to depress prices. By the 1930s, the inflow into the subcontinent of 'British refined', and of sugar dumped by a number of continental European producers, kept the price of Java sugar so low in India as to mean that it was regularly sold below cost.

The Java industry was not holding its own. In 1932 the NHM's agent calculated that at Bombay alone, imports of Java sugar and European beet sugar were roughly on par: 67,000 MT as against 61,000 MT.[48] In the subcontinent as a whole in that year, imports from elsewhere exceeded those of Java by a margin of nearly 30 per cent (Java 366,800 MT as against other imports of 516,000 MT). Suppliers of the South

44 This was an arrangement between Maclaine Watson, MacNeill & Co and Fraser Eaton with Ralli Brothers, London. See the various letters relating to 'Maclaine Sugar Company' et cetera in: NA, NIVAS, 2.20.09.03, inv. nr. 518.

45 On Volkart, founded in 1851 in Winterthur and Bombay simultaneously, see Rambousek, Vogt and Volkart 1991; Dejung 2007.

46 In 1934, it was said that the firm 'nu het leeuwenaandeel in de Javasuiker business in handen heeft gekregen' (Schuitemaker, 'Reisverslag', 1934, p. 65, in: NA, NIVAS, 2.20.09.03, inv. nr. 382).

47 See Appendix 2. Main export destinations Java sugar, circa 1880-1940.

48 For imports of sugar from Russia, see, for example, Jaarverslag NHM Bombay 1931, p. 42; 1932, pp. 46-7, in: NA, NHM, 2.20.01, inv. nr. 5065.

Asian market included Germany, Czechoslovakia, Poland, Hungary, the USA, Mozambique and Portuguese East Africa.[49] In this context, moreover, the Java industry did itself no favours by underestimating the discrimination of the Indian consumer. One well-researched report in 1934, for example, drew attention to the fact that the Dutch had been off-loading old and inferior sugar on the markets of the subcontinent; that Java was not matching the consistent quality of other imports; and that consumer discernment about the kind of sugar they preferred was working to Java's disadvantage.[50]

The underlying problem, however, was that British India was developing a very substantial industrialized sugar industry of its own – protected by tariff barriers against imported sugar by a Raj anxious to placate Indian capital and provide an income of sorts for cultivators who had been badly hit by a sharp fall in raw-cotton prices. At the beginning of the 1930s, duties on imported sugar were raised exponentially – they now amounted to around 200 per cent, according to Dutch reports, which also included information not only about this degree of 'exorbitant protection', but also about government support for the industry, including technical advice and freight concessions on the railways.[51]

Nonetheless, the effect was not immediate. Attempts to introduce industrial sugar production into the subcontinent had a chequered history dating back to the 1840s.[52] The most immediate precursors of industrialized production, however, were to be found in refineries established in the 1870s. For the most part, they were in the business of taking *gur* and processing it into a more sophisticated product. From the late nineteenth century onward, however, industrial plants, manufacturing centrifugal sugar and designed to handle cane rather than *gur*, began to reappear. A couple of rather breathless articles appeared in *The International Sugar Journal* early in the new century, for example, reporting that the newly established India Development Company Ltd of London and Calcutta was about to build an elaborate industrial factory in Bihar, with equipment, including grinding mills, from celebrated Glasgow engineering firms of Mirrlees Watson and McOnie Harvey.[53] Nonetheless, as late

49 Jaarverslag NHM Calcutta 1932, pp. 27-8, in: NA, NHM, 2.20.01, inv. nr. 5069.
50 Schuitemaker, 'Reisverslag', 1934, pp. 60-2, in: NA, NIVAS, 2.20.09.03, inv. nr. 382.
51 Jaarverslag NHM Calcutta, 1932, p. 27, in: NA, NHM, 2.20.01, inv. nr. 5069.
52 Ratledge 2009.
53 *India* 1901; *Sugar Bihar* 1902.

as 1931, there were only twenty-nine such factories in the whole subcontinent. Five years later, however, there were more than four times that number,[54] and the NHM's Bombay agent was reporting dolefully on the large amount of machinery being imported (to the value of 55 lakhs of rupees), reckoning that most of it, largely from the UK and the Netherlands, was destined for the sugar industry.[55] During the course of the 1930s, India's output of sugar produced by industrial methods increased more than tenfold, from less than 100,000 MT at the beginning of the decade to well over a million MT at its close.[56]

In consequence of this bourgeoning of India's own centrifugal sugar industry, exports of Java sugar to Calcutta and Bombay were gradually eroded, so that, toward the end of the decade, only a tiny fraction of Java's output serviced what had only ten years earlier been its largest single market. Nonetheless, the pre-war Java industry did not give up easily on the Indian market. Not least, it might be suspected, because they did not really believe that anybody – at least in Asia – could make sugar as well or as cheaply as they did. On this last point they were probably right. Indeed, it was one of the marketing ironies of the interwar depression that the world's cheapest producers of sugar (Java and Cuba) were left with mountains of it on their hands. As to Indian 'incapacity' as manufacturers, on the other hand, the Java sugar interests plainly deceived themselves, in so far as they gave credence to some of the bleaker prognoses.

One such report, dating from 1933 and penned by a Java technician who had relocated to India, dwelt on purported Indian mismanagement and stubborn lack of know-how. Why, he wrote in shocked disbelief, Indian subordinates even *argued* with him! He predicted that the current expansion of industrial sugar production in the subcontinent would be a short-lived phenomenon. [57] A more considered analysis made scarcely a year later, however, came to a very different conclusion. Its author was perfectly ready to concede that, whatever the early difficulties may have been, the industry in the subcontinent could match Java in quality

54 Amin 1984:95, 111.

55 Jaarverslag NHM Bombay, 1934, p. 38, in: NA, NHM, 2.20.01, inv. nr. 5065.

56 See Appendix 2: Main export destinations Java sugar, circa 1880-1940.

57 B.J. Gratama, 'De suikerindustrie in Britisch-Indië', 3-2-1933, in: NA, NHM, 2.20.01, inv. nr. 9159. Gratama had previously been an industrial chemist (*chemiker*) at the NHM's Poerwodadi sugar factory in East Java (*Adresboek Nederlandsch-Indië* 1929:393).

in most ranges of product.[58] By 1937, Dutch agents there were indeed warning Java that India was nearly self-sufficient in sugar. To be sure, there were some wild fluctuations. In 1939 imports of Java sugar suddenly surged, but this was primarily because of accidents of nature – flooding, crop disease and insect plagues – rather than because of any structural deficiency in the industry itself, which was said to be becoming more profitable on account of rising prices.[59] In short, the secular trend was firmly against Java.

JAVA, JAPAN AND THE RAJ: GLOBALIZATION AND THE INTERNATIONAL SUGAR ECONOMY IN THE INTERWAR DECADES

The rise of Formosa to prominence in the international sugar economy of the interwar years perhaps reflected a rather old-fashioned, even mercantilist approach to the creation of sugar empires on the part of Japanese capital, in so far as it was based on notions of the self-sufficiency of the Yen Block. Nonetheless, together with what happened, more or less contemporaneously, in the Indian subcontinent, it was also suggestive of developments of a rather different stamp. The element of 'self-sufficiency' – and its close association with the economic autarchy of the depression era – was certainly very much in evidence, and heavily promoted by those who invested their capital in the industry. Yet, there was another tendency present in the rapid expansion of industrialized sugar production in the subcontinent in the course of the 1930s.

Perhaps unconsciously, NIVAS management alluded to it in 1934, when they lamented 'this sending back and forth of huge quantities of sugar' from one end of the earth to another, something that they regarded as 'indicative of the chaos in which the world finds itself'.[60] It was also indicative, however, of something else: something that can quite appropriately be termed 'globalization', albeit in a form in which the palpably global character of the international sugar economy was compromised by an ostensibly paradoxical tendency toward autarchy. It is true, of course, that few internationally traded commodities were quite

58 Schuitemaker, 'Reisverslag', 1934, p. 59, in: NA, NIVAS, 2.20.09.03, inv. nr. 382.
59 Jaarverslag NIVAS 1938-1939, p. 40, in: NA, NIVAS, 2.20.09.03, inv. nr. 13.
60 Jaarverslag NIVAS 1933-1934, p. 57, in: NA, NIVAS, 2.20.09.03, inv. nr. 8.

as ambiguously located on the cusp of protection and globalization as sugar. The relationship between the two, however, was more symbiotic than contradictory.

The trend toward economic autarchy was, as we have already seen, much in evidence in the interwar decades, and in the 1930s in particular. Tariff barriers, punitive import duties, and the like were the order of the day, and did much damage to the Java sugar industry's chances of remaining a viable exporter of the commodity. Nonetheless, in the specific context of the international sugar economy, the policies of economic autarchy pursued in the Yen zone, in southern China and in the Indian subcontinent also reflected the global spread of industrialization. Such policies formed a shell within which the industrial manufacture of sugar could become established in parts of Asia where this had previously been commercially difficult, if not impossible. In this sense, economic autarchy and globalization were two sides of the same coin. In tandem, moreover, they created a situation in which, in classic globalization mode, the international sugar economy would seek to shift its operations to wherever they promised the greatest profit, regardless of political or national boundaries.

A prime case in point is the nexus between the declining sugar industry of late colonial Java and the burgeoning manufacture of industrially produced sugar in South Asia in the 1930s, where the erection of a high tariff barrier for imported sugar created a situation in British India that was highly conducive to a shift in manufacturing operations within the international sugar economy. The query from an Indian businessman to Prinsen Geerligs quoted at the beginning of this chapter was indicative of a very real situation. The early 1930s saw not only the decimation of Java sugar as an export industry, but also, quite literally, a transfer of productive capacity to the Indian subcontinent, involving the transfer of both machines and men. Second-hand, now redundant sugar-making machinery was sold to Indian interests, and (Indies) Dutch technicians and managers sought refuge from the depression in the new, rapidly expanding sugar industry of the subcontinent. Many overseas sugar industry operatives sought their fortunes in India at this time, but 'above all it was Java that had supplied a substantial contingent, among them some very experienced personnel'.[61] The caption to a contemporary photo-

[61] Schuitemaker, 'Reisverslag', 1934, pp. 34-5, 78-9, in: NA, NIVAS, 2.20.09.03, inv. nr. 382.

graph of the staff quarters at one of the new Indian factories points to the 'two Dutch children' standing out front.[62] European personnel from Java were joined by numerous Indies-Chinese sugar 'boilers', the people, that is, who formed the mainstay of the skilled staff who ran the multiple effects and vacuum pans that lay at the heart of the industrialized sugar factory. 'Totally *senang* [contented] they were not', so it was reported, but the upside was that they found it cheap and easy to travel back and to between India and Java to meet the seasonal needs of their new employers and maintain contact with their families.[63]

In this context of globalizing tendencies, it was of special significance that Kian Gwan, the Java-based Indies 'multinational', was to be found in the 1930s projecting at least one sugar factory in the subcontinent (as we have seen, the firm was also involved in the nascent sugar industry of southern China).[64] At around the same time, plans were afoot on the part of Fraser Eaton & Co, Java's biggest firm of European sugar traders (and part of the Maclaine Watson group), to shift one or other of their Java factories to the subcontinent, in conjunction with Ralli Bros, who were their long-time associates in the business of exporting Java sugar to India.[65] Another face of globalization was apparent, moreover, in Ralli's simultaneous import into the subcontinent of *British* sugar, which was currently cheaper than its Java counterpart. 'Sentiment' and 'loyalty' had no part in this game.[66]

Of course, it would be possible to over-emphasize the overall importance of this shift from Java to India. It took place, as might be imagined, in the larger context of the growth of a corps of well-trained South Asian sugar operatives, supervisors and managers (for whom a major

62 Schuitemaker, 'Reisverslag', 1934, p. 78, in: NA, NIVAS, 2.20.09.03, inv. nr. 382.

63 Schuitemaker, 'Reisverslag', 1934, p. 79, in: NA, NIVAS, 2.20.09.03, inv. nr. 382.

64 For the report of a projected deal by Kian Gwan to build a factory in Rampur State, circa 1935, see Schuitemaker, 'Reisverslag', 1934, p. 2, in: NA, NIVAS, 2.20.09.03, inv. nr. 382. According to this source, the deal fell through when Kian Gwan asked for a substantial deposit of some 300,000 rupees from the state authorities in Rampur, and relations declined to the point where Kian Gwan's representative was told not to show his face in the state again.

65 Schuitemaker, 'Reisverslag', 1934, pp. 34-5, in: NA, NIVAS, 2.20.09.03, inv. nr. 382. Schuitemaker reported that although he had been told by Ralli executives that they were exclusively interested in importing sugar, he subsequently discovered that Fraser Eaton had sent one of their people (a Mr. Lawrence) to India (in 1933?) to discuss the relocation of manufacture from Java to the subcontinent.

66 For the dispute between NIVAS and Maclaine Watson (Ralli's associates in the sugar trade) over the alleged overpricing of Java sugar, see the exchange of letters in early 1933 between N. McNeill of Maclaine's London Office and the NHM's A.A. Pauw, in Amsterdam, in: NA, NHM, 2.20.01, inv. nr. 2919.

sugar school and research station had been established) and a plethora of domestic Indian sugar capital. Likewise, it occurred in a context in which a great deal of new equipment was supplied by manufacturers in the UK, Germany, Belgium, France and the Netherlands – with the leading Dutch firm of Stork-Werkspoor well to the fore![67] Nonetheless, the shift of personnel and machinery from Java to India – and the relocation plans of several major operators – was indicative. At the very least, it was a harbinger of post-colonial developments in the international sugar economy that began, as did many postcolonial trends, in the interwar decades rather than, as has often been thought to be the case, in the post-Second World War era.

GLOBALIZATION AND AUTARCHY

The interwar depression's impact on Java sugar production needs to be located within a much broader framework of developments that began around 1920 and only concluded with the outbreak of war in the Pacific more than two decades later. The endogenous nature of Java's sugar industry, bereft of the (relatively) secure 'home' markets that characterized virtually all of its counterparts in the international sugar economy of the late colonial era, always had the potential to spell trouble. The situation in which the industry found itself – one in which sugar was as global a commodity as oil is today – was accentuated rather than caused by in the interwar depression of the 1930s.

In the case of East Asia, the critical development, played out over the better part of twenty years, was Java's relation to the Japanese sugar empire whose origins dated back to the very end of the nineteenth century. In the Western hemisphere, Cuba – Java's occidental counterpart, and the world's largest exporter of cane sugar during the period concerned – remained (however uneasily) within the orbit of an American sugar empire that embraced both the old Spanish Caribbean, Hawaii, the Philippines and the United States' own domestic producers. In 'the East' Java clearly had the potential to be similarly located within the parallel, virtually contemporaneous, though smaller, Japanese imperium, whose

67 Schuitemaker, 'Reisverslag', 1934, p. 78, in: NA, NIVAS, 2.20.09.03, inv. nr. 382.

production zones extended southward from Korea by way of Formosa into the islands of the South Pacific.

This did not happen, for a number of reasons. The resistance of the Netherlands Indies' state to the forces drawing it into the Japanese orbit combined with the crisis-ridden nature of the 'empire' itself, marked by the collapse of one of its biggest enterprises in 1927 and a subsequent decade of conflicted sales in its main market on the Chinese mainland. The net effect was to marginalize the Java producers and promote the expansion of their competitors in Formosa which, unlike Java, was quite unambiguously within the Japanese sphere. Although the British-owned Taikoo refinery in Hong Kong maintained its long-standing ties with the Java industry more or less throughout the 1930s, its own reduced markets in China (consequent, in part at least, on the expansion of Japanese power and influence) meant that it could not provide Java's salvation.

Java's position vis-à-vis its markets in the Indian subcontinent was ostensibly markedly different. In South Asia – and in sharp contrast to the situation in China – from the late 1920s onward, the Java producers found themselves faced with the rapid industrialization of sugar production on a large and strikingly successful scale. Within a decade, South Asia became largely self-sufficient in industrially manufactured, centrifugal sugar. Similarly in contrast to war-torn China, India in the interwar decades benefited from a *pax Britannica* that enabled its indigenous entrepreneurial and business middle classes to exploit tariff protection in a way that eventually proved impossible for their counterparts in the cities of coastal China. Nonetheless, there remained a striking similarity between the situation faced by Java's sugar exporters in both South and East Asia in the interwar decades: the end of Java's hegemony in Asia as the region's only large-scale producer of industrially manufactured sugar and the association of this development with depression-era economic autarchy in Asia as a whole.

Conclusion and postscript

The story of 'Big Sugar' in Indonesia

During the middle decades of the nineteenth century, colonial Indonesia emerged as a leading sector in what was rapidly becoming a truly international sugar economy, and did so on the basis of a 'precocious' industrialization of its manufacturing sector. Subsequently, from the 1880s onward, the radical transformation of its agricultural base in Java itself, and the opening of new markets for industrially manufactured sugar elsewhere in Asia, provided the foundation for the industry's successful entry into an age of mass production to which it was otherwise ostensibly little suited. Inter alia, the existence of those markets, combined with the fact that Indonesia's colonial-era sugar factories were not tied to overseas refining interests (as was the case, for example, with Cuba) led to a situation in which they produced not only raw sugar for refining elsewhere, but also huge amounts of so-called factory white, a form of the commodity that was available for direct consumption without further processing. This was an almost unique development for a major cane-sugar industry. Inter alia, it enabled Indonesia's colonial producers to compete on the South Asian market (at a time when modern refineries scarcely existed there) with the great beet sugar producers of Central Europe, the world's largest factory white manufacturers, who had developed a global reach for their output early on. Elsewhere in Asia, however, Indonesia was reliant on supplying raw sugar to huge refineries in Hong Kong and, subsequently, Japan.

The single-most striking aspect of the situation was the industry's unique degree of dependence – at least, for so large a producer – on 'exogenous' markets. Having no 'endogenous' metropolitan market for its output worth mentioning (the price paid for being the colony of a minor European power that owed its continued presence in Indonesia to the needs of international diplomacy), the sugar companies operating

in the colony during the late colonial era were forced to find markets for the commodity in territories where Holland exerted little or no imperial clout. For much of the period concerned, moreover, they had to do so in competition not only (until 1914) with European beet sugar producers, but also with Caribbean cane sugar manufacturers and newly emerged Japanese sugar interests. In this situation, price was obviously important, and although there is some argument that Cuban sugar was even cheaper,[1] Indonesia's colonial producers were successful over time in making their output very cheap indeed. Proximity to their Asian market also gave them a freight advantage. But in the circumstances in which the industry found itself in the 1930s, price was hardly the key issue.

By the 1920s, colonial Indonesian suppliers had come to dominate the market for imported sugar throughout Asia, and virtually all their output went there. Toward the end of the decade, however, this commercial strategy began to unravel, in circumstances greatly exacerbated by economic autarchy elsewhere in Asia, encouraged by the onset of the interwar depression. Colonial Indonesia was pushed to the margins of a Japanese sugar empire whose main supplier it had previously been, and, in the Indian subcontinent, locally produced, industrially manufactured sugar rapidly ousted it from what had been its largest single market. These two developments ought to have signalled the end of large-scale commodity production in Java, yet they did not do so. After a brief hiatus in the mid-1930s, production in Java resumed again on a considerable scale, albeit one much reduced from the industry's pre-depression peak of activity. By 1940, colonial Indonesia was again producing sugar on a significant scale by world standards. There were several reasons for this.

In part, they related to the industry's history in the decade prior to the interwar depression. During the course of the 1920s, the industry had succeeded in overcoming a variety of major obstacles to the further expansion, or even the maintenance of existing levels, of production. In so doing, it had rationalized its fertilizer use (and been blessed with a sharp fall in its import price after a potentially disastrous peak around 1920), improved its irrigation systems and – in a rather different arena – had begun to forge a rather better understanding with the state bureaucracy than had been the case earlier in the century. In turn, this latter development enabled Big Sugar to benefit from the increasingly hard line taken

[1] Dye 1998:4. The comparative costing of sugar production nonetheless remains something of a morass, heavily influenced by different systems of accountancy, and the like.

by the colonial authorities toward peasant 'unrest' during the course of the decade. This was a big improvement from the sugar companies' point of view, since, from quite an early date in their mutual history, sections of the bureaucracy (while others were altogether more compliant) had attempted to curb what was seen as Big Sugar's propensity to disintegrate the peasant society which was regarded as the bedrock of colonial rule. Not only were there clear signs of a rapprochement: there were also signs that colonial Indonesia was edging toward a 'corporate' state that held Big Sugar and the state bureaucrats in a mutual embrace.

Important as the agency of the state was, however, during the second half of the 1920s, two other developments were absolutely crucial to the resumption of growth and the reduction of costs. One was the industry's success in reducing the cost of labour inputs (especially in field production), which appears to have been contingent on a new degree of impoverishment in the countryside; this drove workers to seek the industry's wage, while creating the conditions in which wages could be lowered. The other factor was a dramatic improvement in plantation productivity, consequent on the rapid adoption of a newly 'invented', ultra-high-yielding variety of cane. This was a situation that could be capitalized upon once colonial Indonesia's huge backlog of unsold sugar had finally been disposed of circa 1936, and factories began to open their doors again for business.

The producer's pre-depression financial standing had a part in this revival. The singularity, even idiosyncrasy, of Indonesia's colonial sugar industry was reflected, inter alia, in the way in which it capitalized its (expanding) operations. One consequence of this was that the industry remained a closed shop in which a very significant increase in productive capacity was largely financed from retained profits. This took place, moreover, under the aegis of a group of mainly Dutch companies that had come to dominate the industry late in the nineteenth century and remained in that dominant position in 1940. There was no internationalization of the large-scale commodity production of sugar, such as took place in the case of other major export staples produced in late colonial Indonesia. As a result, Indonesia's colonial sugar producers were (for the most part) neither indebted to overseas banks, nor in financial thrall to overseas refining interests. Predominantly, their financial strategies had been conservative. One of the consequences of this was that when interwar depression threatened to destroy the industry in the early 1930s,

most sugar companies were not only 'cashed-up', but had huge reserves at their disposal. In short, the depression had created an unprecedented opportunity for rationalizing the industry's operations, while not bankrupting most of the major producers.

Above all else, however, depressed conditions in the countryside, compounded by the extent to which factory closures had themselves diminished rural employment opportunities, brought down wages and led to a (temporary) abatement in the secular trend for land rentals to rise. Production costs in Java during the late 1930s, as the industry 'got back on its feet', were lower than they had been for fifty years or more, enabling Indonesia's colonial producers to manufacture sugar cheaply enough for them to take advantage of 'spot markets' – wherever they arose worldwide. This was just as well, since the newly 'corporate' state proved an unreliable ally for Big Sugar on the commercial front. Indonesia's colonial sugar companies did not hold sway over other sectors of capital to the extent that had once been the case, and when it came to the crunch – in relation to a potential trade-off between imports of Japanese cotton and exports of Indonesian sugar – it was these other sectors of capital (located, like sugar, as much in the metropolis as in the colony) that won the day. Attempts to reintegrate Java in the Japanese sugar empire were thereby stymied. Even so, this was far from the end of the story.

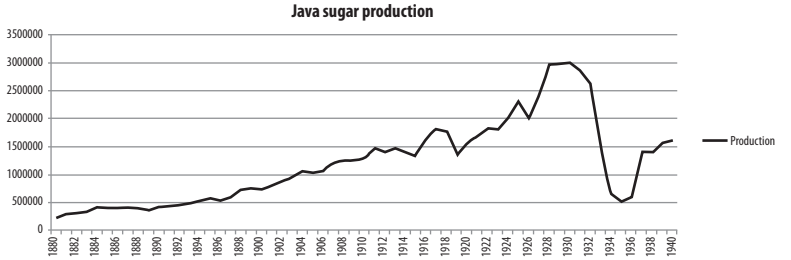
Most histories of Indonesia's colonial-era sugar industry have taken the onset of the interwar depression, the consequently large-scale closure of Java's factories and the associated plummeting of production as signalling the industry's effective demise. In fact, this was far from being the case. By the time that the Second World War engulfed the erstwhile Netherlands Indies in the form of a Japanese invasion in the early months of 1942, Big Sugar had resumed operations in colonial Indonesia in no uncertain fashion. Some eighty of the pre-depression factories had reopened, around 50 per cent of the industry's productive capacity had been restored, and output in 1941 stood at around 1,700 MT, or approximately 60 per cent of what it had been in 1930. Records from a number of major sugar companies suggest that they were operating at a modest level of profitability (given their huge prior investment in infrastructure, this was undoubtedly better than letting their 'capital' lay idle).

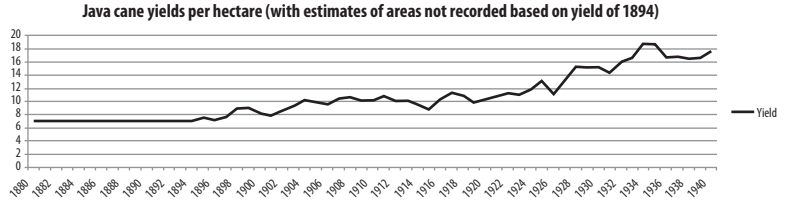
In these circumstances, the industry indeed had a future: the infrastructure, personnel and workforce took a battering during the Second World War and the national revolution against the Dutch that followed it – as did its commercial strategy. Indeed, it disappeared from the radar of the international sugar economy in the wake of the Japanese invasion of the Netherland Indies in the early months of 1942. Yet, enough was left for a significant degree of rehabilitation to be achieved in the post-war and post-Independence years. Indeed, by the time of the industry's nationalization in the late 1950s, some fifty or more factories were again operating (including two or three new ones). There were two obvious explanations for this 'persistence'. First, Indonesia's (ex-)colonial factories had found a new market for their product among Indonesian consumers themselves; second, in resuming production the industry could take advantage of a desperate need for work in the Javanese countryside.

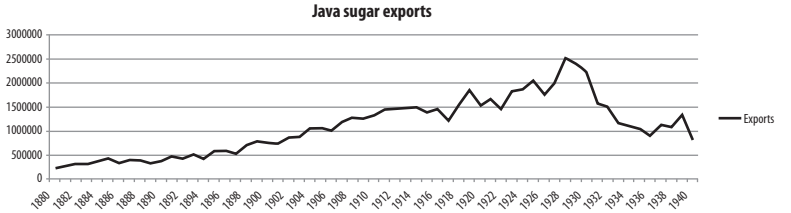
Somewhere not so very far in the background of these developments, moreover, was a new state keen to show its credentials by being self-sufficient in a major, 'modern' commodity (that is, white sugar) and a new, 'entrepreneurial' army equally keen to profit from this, and from the leverage in rural Java which control of the sugar industry would bring. Leverage was consolidated in the wake of the large-scale massacres of 'communists' in Java in 1965-1966, massacres that the army either facilitated or itself perpetrated. Even so, leverage had its limitations in circumscribing the checks to the industry imposed by the 'opportunity cost' of cane, something which became even clearer in the late 1970s, when a state-inspired switch to small-holder cane production did little to halt the industry's declining productivity. The solution proved to lie in the move of the bulk of Indonesian sugar production away from Java and into various, far less densely settled areas of the 'Outer Islands' of Indonesia – akin to what the Dutch had tried in a 'remote' corner of Java itself in the opening decades of the twentieth century. These developments, however, all belong to a different story than that encompassed in the pages of the present volume.

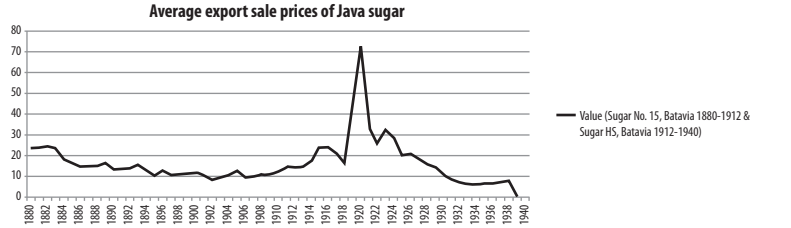
Appendix 1

Various data, circa 1880-1940









Sources: Korthals Altes 1991:148-64, 1994:87-115; Creutzberg 1975:63-76.

Appendix 2

Main export destinations Java sugar, circa 1880-1940

	West of Suez	North America	British India	China	Japan inc. Formosa	Australia	Singapore	Others	Totals
1890/91	197 918	84 542	4 390	80 816		32 736	20 806	38	421 246
1891/92	219 139	61 834	5 278	100 252		49 241	11 515	12	447 271
1892/93	161 370	99 177	4 095	107 800		50 735	20 083	13	443 273
1893/94	107 520	149 749	5 085	172 845		47 782	21 937	5	504 903
1894/95	133 847	137 990	7 692	151 042		33 245	30 575	11	492 402
1895/96	312 059	118 739	5 595	143 818		15 266		9	613 640
1896/97	298 560	62 232	5 085	102 066	260	18 726	20 068	9	507 006
1897/98	21 183	299 354	5 614	150 452	1 235	32 453	30 039	6	540 336
1898/99	65 442	405 807	8 277	152 202	18 984	2 534	84 130	3	677 379
1899/ 1900	16 261	504 143	12 862	139 024	23 012	13 509	23 748	4	732 563
1900/01	11 059	369 800	17 935	140 018	31 481	71 826	33 800	1	675 920
1901/02	182 395	135 584	22 395	190 196	51 369	83 100	29 156		694 190
1902/03	14 700	409 401	30 290	197 169	68 676	78 563	41 254		846 213
1903/04	120 551	182 062	72 516	239 092	152 829	73 335	46 903		894 286
1904/05	229 226	300 704	96 622	175 035	120 448	14 241	40 624		1 006 693
1905/06	404 325	35 834	67 746	149 543	131 424	18 269	66 416		900 598
1906/07	62 283	178 477	149 929	171 010	193 001	40 402	68 747		863 849
1907/08	212 187	158 906	319 251	156 455	204 022	5 595	8 126		1 094 541
1908/09	126 514	347 351	312 662	170 332	110 407	28 167	12 726		1 107 859

	West of Suez	North America	British India	China	Japan inc. Formosa	Australia	Singapore	Others	Totals
1909/10	233 646	27 519	390 376	231 809	95 503	81 391	14 664	1 603	1 076 600
1910/11	259 631	45 034	445 621	230 796	124 501	21 371	55 252	447	1 182 653
1911/12									
1912/13	177 096		448 675	204 691	209 490		101 353	147 755	1 289 060
1913/14	6 093		640 236	287 922	233 128		100 910	25 992	1 294 281
1914/15	620 158		333 513	150 999	100 356		62 407	58 003	1 325 436
1915/16	380 739		455 913	197 539	47 317		52 261	84 367	1 218 136
1916/17	716 481		441 738	141 931	48 728		59 431	42 248	1 450 557
1917/18	429 459		354 676	173 031	92 721		176 253	27 552	1 253 692
1918/19	445 550		376 065	344 851	445 067		168 340	42 378	1 822 251
1919/20	469 195		349 972	190 213	281 509		64 196	111 248	1 466 333
1920/21	772 642		259 259	184 053	94 226		42 451	135 706	1 488 337
1921/22	173 435		628 280	331 695	312 686		66 133	13 243	1 525 472
1922/23	487 835		451 808	294 735	277 353		62 588	71 714	1 646 033
1923/24	575 193		416 402	261 841	278 600		61 073	63 841	1 656 950
1924/25	402 777		536 614	382 541	329 173		80 350	93 784	1 825 239
1925/26	254 297		769 952	389 255	491 636		88 702	124 733	2 118 575
1926/27	10 604		805 250	345 867	404 860		78 055	107 895	1 752 531
1927/28	196 860		846 905	404 601	450 871		84 257	150 427	2 133 921

	West of Suez	North America	British India	China	Japan inc. Formosa	Australia	Singapore	Others	Totals
1928/29	438 864		1 096 972	602 516	254 042		88 762	181 637	2 662 793
1929/30	289 000		1 073 910	629 233	248 154		82 001	110 400	2 432 698
1930/31	7 113		975 877	602 302	282 721		95 328	148 313	2 111 654
1931/32	135 438		515 614	533 990	126 496		63 923	167 693	1 543 154
1932/33	333 643		425 727	295 122	81 952		58 933	136 096	1 331 473
1933/34	138 953		320 639	272 484	183 015		48 864	144 267	1 108 222
1934/35	145 332		402 076	281 473	151 317		58 553	148 829	1 187 580
1935/36	8 686		288 702	178 176	213 546		59 656	128 370	877 136
1936/37	130 045		114 726	248 254	256 443		158 819	82 368	990 655
1937/38	412 115		98 310	123 800	196 557		138 971	63 654	1 033 607
1938/39	619 375	20 807	86 727	141 129	1 701	384	63 961	241 743	1 174 846
1939/40	447 858	48	299 266	136 536	60	439	19 308	324 755	1 228 290
1940/41	306 009	48	27 239	244 703	21	166	21 540	248 237	847 970

Sources: H.C. Prinsen Geerligs 1912:140-1; H.C. Prinsen Geerligs and R.J. Prinsen Geerligs 1938:83-4; Jaarverslagen 1938-1939 – 1940-1941, in: NA, NIVAS, 2.20.09.03, inv. nrs 13-15.

Appendix 3

Production costs at the Modjo Agoeng sugar factory, Surabaya Residency, East Java, 1905-1940

	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922
staff	0.16	0.14	0.16	0.17	0.16	0.15	0.17	0.17	0.23	0.28	0.23	0.24	0.26	0.38	1.4	0.91	0.75
wages cane cutters			0.03	0.03	0.02	0.01	0.01	0.01	0.01	0.03	0.01	0.01	0.19	0.22	0.36	0.34	0.38
trans-port of cane	0.57	0.53	0.58	0.61	0.55	0.53	0.54	0.56	0.58	0.65	0.61	0.63	0.36	0.45	1.1	1.08	1.23
wages of coolies	0.09	0.08	0.1	0.11	0.09	0.09	0.1	0.12	0.13	0.1	0.09	0.1	0.1	0.12	0.42	0.28	0.24
fuel	0	0	0	0.01	0	0.01	0.01	0.01	0.03	0.06	0.09	0.13	0.14	0.21	0.84	1.59	0.8
Total	**2.34**	**2.15**	**2.28**	**2.45**	**2.2**	**2.22**	**2.3**	**2.43**	**2.9**	**3.16**	**2.96**	**3.38**	**3.22**	**3.98**	**6.67**	**6.85**	**5.36**

1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
0.8	0.66	0.59	0.66	0.69	0.55	0.58	0.44	0.5	0.36					0.33	0.25	0.24	
0.38	0.34	0.35	0.37	0.36													
1.05	0.81	0.75	0.75	0.73	0.98	0.97	0.98	0.93	0.79								
0.18	0.14	0.14	0.13	0.14	0.13	0.12	0.1	0.1	0.08								
0.19	0.17	0.06	0.22	0.28	0.27	0.18	0.05	0.04	0.01					0.07	0.01	0.02	
4.48	**4**	**3.9**	**4.14**	**4.29**	**3.87**	**3.71**	**3.36**	**3.35**	**2.68**					**1.63**	**1.5**	**1.52**	

This set of data relate to production costs - calculated per quintal (100 kilo) of sugar - at the factory during the campaign or manufacturing season. These costs are listed under the main heads of (a) payment to European and Indonesian staff; (b) wages cane-cutters; (c) wage to cane haulers (from 1928 onward lines (b) and (c) are combined in the factory accounts); (d) wages of the coolies employed in the factory; (e) fuel costs in the factory; (f) total costs per quintal of sugar including lesser expenses not listed under (a) to (e)

	1906	**1907**	**1908**	**1909**	**1910**	**1911**	**1912**	**1913**	**1914**	**1915**	**1916**
staff	41.37	40.84	42.51	43.22	42.7	40.04	39.1	38.55	39.39	43.37	41.84
land rent	50.02	52.96	50.86	50.43	52.78	54.84	58	59.35	58.31	59.78	59.61
field work	188.35	159.9	156.22	160.65	160.02	164.37	175.53	185.29	199.71	193.9	181.84
fertilizing	81.45	93.06	84.88	74.47	76.61	79.67	93.51	107.88	99.1	89.51	80.84
Total	**474.63**	**442.88**	**404.98**	**407.84**	**408.98**	**396.92**	**459.88**	**475.53**	**520.61**	**493.8**	**469.88**

1917	**1918**	**1919**	**1920**	**1921**	**1922**	**1923**	**1924**	**1925**	**1926**	**1927**	**1928**
48.59	46.98	56.45	55.37	90.32	105.13	86.86	86.75	93.51	96.12	102.41	107.24
67.8	66.84	65.1	69.16	76.32	77.89	90.37	94.3	84.42	77.27	76.33	78.11
152.73	200.98	170.49	233.94	253.56	297.89	259.56	242.88	229.34	203.79	205.91	211.38
80.59	101.65	80.12	159.49	184.18	222.92	141.74	130.06	134.74	113.07	115.03	106.27
473.55	**542.14**	**503.16**	**678.35**	**907.33**	**1018.8**	**917.59**	**765.36**	**912.74**	**799.47**	**687.12**	**639.45**

1929	**1930**	**1931**	**1932**	**1933**	**1934**	**1935**	**1936**	**1937**	**1938**	**1939**	**1940**
102.76	99.54	93.23	96.77					43.31	48.77	52.62	52.23
82.77	90.23	86.09	144.17					57.5	41.93	43.13	58.4
189.32	184.99	155.85	145.13					59.67	67.18	75.87	81.74
97.41	92.41	91.05	80.74					34.21	34.91	35.35	44.09
571.73	**567.56**	**491.23**	**525.08**					**229.74**	**217.18**	**238.47**	**272.2**

This set of data relate to the field costs of production at Modjo Agoeng up to but not including the cutting of cane, and are calculated per hectare of cane planted. These costs are listed under the main heads of (a) payments to European and Indonesian field staff; (b) rent paid to the peasantry for hire of their fields; (c) wages paid to field workers; (d) the costs involved in the purchase and application of fertilizer; (e) total cost per hectare, including lesser expenses not included in line (a) to (d)

Source: Jaarverslagen administrateur suikeronderneming Modjo Agoeng, in: NA, NHM, 2.20.01, inv. nrs 9383-9385.

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